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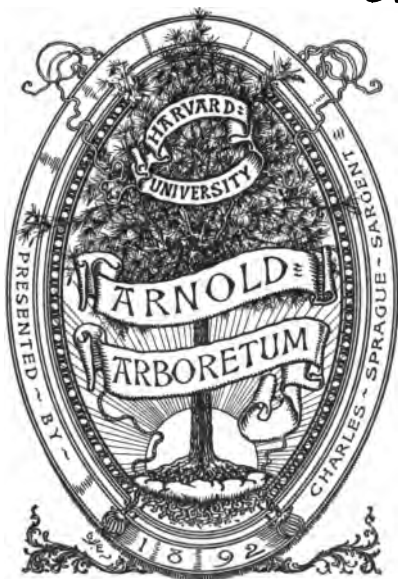
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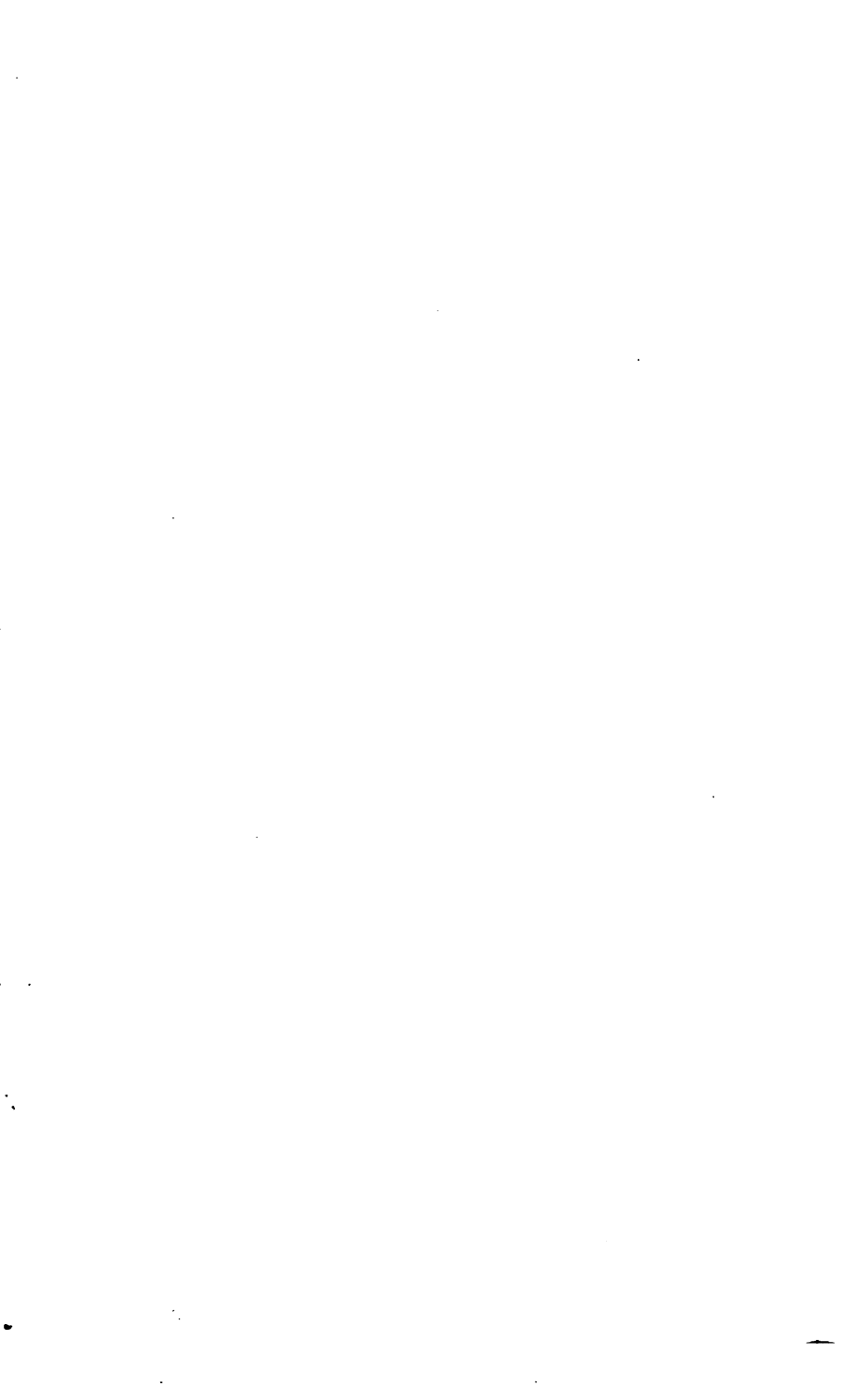
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HISTORICAL AND BIOGRAPHICAL
S K E T C H E S
OF THE PROGRESS OF
B O T A N Y
I N E N G L A N D,
FROM
ITS ORIGIN
TO THE
INTRODUCTION OF THE *LINNÆAN* SYSTEM.

BY
RICHARD PULTENEY, M.D. F.R.S.

IN TWO VOLUMES.

V O L. I.

L O N D O N:
PRINTED FOR T. CADELL, IN THE STRAND.

1790.

“ Quid quærunt mortales in globo hocce
lubrico et horario magis, obtenta suppellectili ad
vitam maxime necessaria, quam quod levis modo
et honesta recordatio nominis—perveniat ad pos-
teros, duretque per aliquot dies ulterius? Quot
Heroes, Reges et Imperatores, quot fortes et
strenui, non hanc ob causam solam, ingluviem
furentis Bellonæ incurrerent, ut modo posteris
nomen eorum esset fabula, et cum fabula, me-
moria? Cur non idem *Botanicis* qui nec minora
ausi sunt.”

LINNÆUS.

Bd

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AET 5752-3

T O

SIR JOSEPH BANKS, BART.

President of the Royal Society,
&c. &c. &c.

DEAR SIR,

AS soon as I had determined to lay before the public the ensuing Sketches, I could not hesitate in choosing whose name I should wish might honour the introduction of them into the world — To whom could a work of this nature, with so much propriety be addressed, as to him who had not only relinquished, for a series of years, all the allurements that a polished nation could display to opulence and early age, but had exposed

A 2

himself

iv DEDICATION.

himself to numberless perils, and the repeated risk of life itself, that he might attain higher degrees of that knowledge, which these sketches are intended to commemorate, in his predecessors and countrymen; and as the result of which, he has enlarged the stock of natural science, beyond all prior example?

That liberality, Sir, with which you impart the fruit of your various labours, and that distinguished patronage you so amply afford to natural history at large, and to botanical science in particular, as they demand, so have they justly secured to you, the grateful acknowledgments of all lovers of that science, and of literature, and philosophy in general.

I have, Sir, on this occasion only to regret, that my distant situation has not allowed me, in the compilation of these pages, those benefits which your most extensive and valuable library would have held forth to me;
and

DEDICATION. v

and of which, you so generously permit the communication, to such as desire to avail themselves of its advantages.

Permit me then, Sir, to have the honour of inscribing to you the following SKETCHES, as to an eminent, and no less candid judge of the subject: and, as a public testimony of that most perfect respect and esteem, with which I am,

DEAR SIR,

Your much obliged, and

Most obedient humble Servant,

RICHARD PULTENEY.

BLANDFORD,
FEB. 28, 1790.

P R E F A C E.

IN the enlightened ages of Greece and Rome, and under the most flourishing state of Arabian literature, Botany, as a science, had no existence. Nor was it till some time after the revival of learning, that those combinations and distinctions were effectually discovered, which, in the end, by giving rise to system, have raised the study of plants, to that rank it holds at present in the scale of knowledge.

If in the contemplation of flowers, mankind at large, have in every age placed one of their purest pleasures, how greatly must these delights be enhanced to the enamoured votary of Botanical Knowledge! who, whilst he surveys that wonderfully varied elegance and beauty, which charm the eye of all, penetrates still farther, and at the same instant, discerns also, those analogies and discriminations,

criminations, in the *number, figure, situation,* and *proportion* of parts, on which are laid the foundations of modern Botanical Science; associations and distinctions, which are veiled from the untaught eye of common observation, howsoever sensible to the general beauties of Nature! And hence, independently of its real and ultimate utility, from the accession of knowledge it brings to the *Materia Medica*, and by its general assistance to the various arts and elegancies of life, the study of the vegetable kingdom, has proved, to numerous speculative and inquisitive minds, the source of much intellectual enjoyment,

This Science is, by many, considered as of so easy attainment, that it is not unusual to assign the name of Botanist, to any man whose memory enables him to repeat the nomenclature of perhaps a few hundred plants; howsoever uninformed he may be, of those principles which entitle him, to the real name and character: With equal justice might any man who knows the names only of the parts of a complex machine, assume to himself that fame which is due solely

solely to the inventor of it. By this degrading idea, men of the first learning and talents in this branch of knowledge, have frequently been levelled with the most superficial enquirers, and the most ignorant pretenders. Hence also this Science, which even in a speculative view, holds no mean rank, and, considered practically, is closely connected with medicine, and with the arts and elegancies of life, has been held forth as a trifling and futile employment. In truth, he properly is entitled, in any degree, to the character of the Botanist, whose acquirements enable him to investigate, to describe, and systematically arrange, any plant which comes under his cognizance. But to these abilities, in order to compleat the character, should be united, an acquaintance with the Philosophy of Vegetables, and with the History of the Science, in all its several relations, both literary and practical, from remote antiquity to his own time : attainments which require a competent share of general learning, and no small degree of painful toil and patient industry, both in the fields and in the closet.

If

If this description of the Botanist be a true one, it manifestly excludes a number of frivolous pretenders; the science itself rises in importance, and admits of great diversity of employment, to the taste, the talents, and learning of those who direct their attention to it. Whilst then it is the province of some to investigate new subjects, to ascertain those imperfectly known, and to record the various improvements and discoveries of the day, let it be that of others, to do justice to departed merit, to recall the scattered remembrances of the lives, and hold out the example of those who have laboured in the same field before them.

In tracing the progress of human knowledge through its several gradations of improvement, it is scarcely possible for an inquisitive and liberal mind, of congenial taste, not to feel an ardent wish of information relating to those persons by whom such improvements have severally been given: and hence arises that interesting sympathy which almost inseparably connects biography with the history of each respective branch of knowledge.

In

In this age, when successful advancements in the study of plants, have so far extended its pleasures, as to render Botany almost fashionable; and at a time, when Biographical writings find a reception heretofore unknown; it became matter of speculation, that no one should have delineated the *Rise and Progress of Botany in Britain*, in connexion with the lives of those who have contributed to amplify and embellish it.

Among the various enquiries which employ the pens of the learned, none perhaps afford more general satisfaction, than such as relate to the origin and progress of science and literature. But when these lead to objects which we love and cherish, they come recommended by a charm that secures a welcome, and thus promise a more peculiar entertainment and gratification: however, disquisitions of this kind are of difficult execution, especially when applied to subjects of a scientific nature, as requiring the union of various talents in the writer—an appropriate share of learning, an extensive literary as well as practical acquaintance with the subject, united to all those qualifications requisite

quisite in a biographer, such as diligence and accuracy in investigating the discoveries of his authors, and impartiality in characterizing them, and in assigning to each his due degree of merit. To these personal requisites must be added, the adventitious circumstances of a situation favourable to his researches, not only from manuscripts, and large libraries, but from actual intercourse with the learned.

Fully sensible in this view of the little claim I have to the character and advantages here spoken of, it becomes necessary, to avoid the censure of temerity, that I should premise some account of the original occasion of this attempt.

The attention I had given to English Botany in my younger days, had prompted me, at one time, to plan a *Flora* of the plants of this kingdom, on an extensive scale; including, besides the medical and æconomical history of each, a *Pinax*, in which it was my design to have distinguished, as far as I was able, the first discoverer of each species, both among foreign writers and those of our own kingdom; and to have arranged

arranged all their synonyms, at large, under each plant, in chronological order. To such a work the following *sketches*, in a somewhat more contracted form, were intended as an introduction. In the mean time, if more important avocations had not, the want of necessary assistance from books, would probably have stopped the progress of a plan of such extent. Although this purpose was relinquished, yet, as the materials were collected, and this part of the design was independent of the other, I flattered myself, that, having made some alterations, and enlarged the whole, under so total a want of any similar work, these anecdotes might afford information to young Botanists, and possibly some amusement to those of more advanced knowledge in the science.

Although botanical writings are the principal objects of these pages, yet, as several of these authors were conspicuous for their various attainments in different branches of literature, their other pursuits and publications, where my resources have afforded opportunity, have occasionally been recited;
and

and I have been more particularly solicitous to collect into one view, under each author, those various temporary and occasional productions, which, after the establishment of the Royal Society, were communicated to that body, and form a part of the *Philosophical Transactions*.

In considering the botanical writings, especially those of the first eminence, I have had recourse, with few exceptions, to the books themselves; but, confined to a private collection, have yet too frequently had occasion to regret the want of more extensive assistance; and, although I have not formally quoted my authorities, on every occasion, they will be sufficiently manifest to all such as are conversant in botanical literature. In the historical and biographical parts, the most material and authentic facts, have likewise been derived from the respective authors in botany: and, not unfrequently, I have availed myself of several of the older periodical publications. Exclusively of these, besides collateral assistance received from separate works, and from various collections of smaller bulk, I more especially

x

acknowledge

acknowledge my obligation to the authors recited below *.

In a work intended to exhibit the progress of the science in *England*, and to assign to each writer his respective praise, I could have wished to have subjoined a com-

* **GESNERI**, *Bibliotheca Universalis*. fol. *Tigur.* 1545. et *ejusd.* *Epitome à Simlero et Frisio*. fol. 1583. item, *ejusdem* *Præfatio in Libros de Natura Stirpium H. Tragi.* 4°. *Argent.* 1552.

PHILOSOPHICAL TRANSACTIONS, 4°.

VAN DER LINDEN, *De Scriptis Medicis à Merckino*. 4°. *Norimb.* 1686.

HERBELOT, *Bibliothèque Orientale*. fol. 1697. *Marbricht.* & 1776.

WOOD, *Athenæ Oxonienses*. fol. *London.* 2 vol. 1721.

TOURNEFORT, *Isagoge in Rem Herbariam. in Rei Herbariæ Institutionibus*. 4°. *Paris*, 1719.

BOERHAAVE *Methodus Studii Medici*. 8°. 1710. *Emaculata et aucta ab Hallero*. 4°. 2 vol. *Amst.* 1751.

CONNICHI, *Introductio in Universam artem Medicam*. 4°. 1726. *Hal.*

FRIEND, *History of Physic*. 2 vol. 8°. 1727.

LE CLERC, *Histoire de la Médecine*. 4°. à *la Haye*. 1729.

MANGETI, *Bibliotheca Scriptorum Medicorum*. 4 vol. fol. *Gen.* 1731.

GENERAL DICTIONARY, 10 vol. fol. 1734—1741.

LINNEÆ, *Bibliotheca Botanica*. 8°. 1737. *Amst.* et 1751.

SEQUIER, *Bibliotheca Botanica*. 4°. *Hagæ Com.* 1740.

TANNER, *Bibliotheca Britannico-Hibernica*. fol. *London.* 1744.

SCHMIEDERL, in *Præfat. ad Gesneri Opera*. fol. *Norimb.* 1753.

BIOGRAPHIA BRITANNICA. fol. *London.* 7 vol. & 2d edit. 4 vol.

MATTHIAS, *Conspectus Historiæ Medicorum*. 8°. *Götting.* 1761.

FABRICII, *Bibliotheca Latina*, 2 tom. 4°. 1723 & 1734, & 3 tom. 8°. ab *Ernesto Lips.* 1773.—*eiusdem* *Bibliotheca Latina medice et jurisfime latinis*, 6 vol. 8°. *Hamb.* 1735—1746.

HALLER, *Bibliotheca Botanica*. 2 tom. 4°. 1772.

GRANGER, *Biographical History of England*, 4 vol. 8°. 3d edit. 1779.

NOUVEAU DICTIONNAIRE HISTORIQUE. 5°. 1765. 6^{ème} edit. 8 tom. *Caen.* 1786.

ELOY, *Dictionnaire Historique de la Médecine*. 4°. 4 tom. *Mons.* tom. 1778.

plete

plete catalogue of all the English plants, with the names of the first discoverer annexed; or of that author in whose work each first occurs, as an English species. The progress I had made in the intended Pinax above-mentioned, would have enabled me to have made this addition; but, as such a catalogue could have afforded gratification only to the more curious and critical botanists, unless thrown into a form, by the addition of other matter, which would have increased the bulk of this work to another volume, it was judged most proper to omit it.

Conscious of the many defects attending these *sketches*, and fully sensible that they merit no higher appellation than what the title imports, it is with much deference, even under that idea, that I submit them to the inspection of the literary world; and, perhaps, the indulgence they require, is greater than ought to be expected: but I am willing to hope, that they will find that reception from learned and candid judges, which such are wont to bestow on a first essay, in any department of literature.

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V O L. I.

Errors in the Printing.

Page 249. line 8. *For* CAMBDEN, *read* CAMDEN.

256. — 16: — apophthegms — apothegms.

HISTORICAL AND BIOGRAPHICAL
S K E T C H E S
OF THE
PROGRESS OF BOTANY,
IN ENGLAND.

C H A P. I.

The origin of Botany in general—Its state in the druidical times—Rites observed by the Druids in collecting the mistletoe, vervain, and selago—All but the mistletoe difficult to be ascertained—Of the herba Britannica, and the roan-tree.

Saxon Botany—Manuscripts extant in that language—Saxon version of Apuleius.

PRIMÆVAL BOTANY.

THE origin of Botany, considered in the most extensive view, must have been coeval with man. Before the invention of arts; the discovery of metals, and the use of implements and arms, by which animals were more immediately subjected

to their power, it must be supposed that the human race derived, from the vegetable creation, the chief part of their sustenance, and the primary conveniences of life. Roots, fruits, and herbs, must then have constituted the food of man. Trials, and experience, would teach him all that choice and variety, which his different situations allowed. The same faithful directors would insensibly inform him of the various qualities, and the different effects of them on his body. As the sphere of his observations and experience enlarged, he would derive the knowledge, and distinction, of such as were of easy, or of difficult digestion. He would discover the flatulent kinds, and such as corrected flatulency : which opened, or which constipated, the body ; which was most nutritive, and probably, by fatal accidents, which were poisonous. Hence the rudiments of medical science.

This various knowledge would be handed down traditionally, from one generation to another, and with it, the names of such as were happily the first discoverers of new aliments, or medicinal properties, would descend

descend with increasing reverence, until, involved in obscurity by length of time, superstition raised them to the rank of gods. Thus, in the early ages of mankind, as now among the still unlettered and uncultivated nations of the earth; the administration of simples, for the cure of wounds and diseases, was almost ever accompanied with superstitious ceremonies and incantations. Hence too, in process of time, the character of the priest and the physician was united; and the sick resorted to the temples of the gods for relief: and, although investigation and rational science made slow progress, yet, in every nation, from the most cultivated to the most barbarous, the number of simples used for medicinal purposes, became by degrees very considerable. Thus, when at length, physic assumed a more regular form, and was taught in the schools of Greece, the writings of HIPPOCRATES enumerate three hundred vegetables used in physic. Four centuries afterwards they were augmented by DIOSCORIDES to near seven hundred; and to these the Arabians added no inconsiderable number of valuable

articles. There is room to believe, that the antient *Gymnosophists* of the East, pursued the study of plants, with a success equal to that of the Greeks ; and the modern nations of the East, the Japanese, the Chinese, and the Brachmans of India, incontestibly excel the enlightened nations of Greece and Rome, in their knowledge of Botany : witness the “ Garden of Malabar,” which comprehends near eight hundred plants ; all which are described, and the virtues recorded, with an accuracy and precision, unexampled in the antient authors of *Greece* and *Rome*. But to approach nearer home : the Druids of *Gaul*, and of *Britain*, cultivated the knowledge of herbs, with no inconsiderable diligence. Whether these antient *Magi* of the West, who were both priests and physicians, sprung from those of the East, and thus derived their knowledge from a common source, a point which has hitherto divided the learned, or, whether their science was the result of their own investigation, I must leave to the critical antiquary to determine.

DRUIDICAL BOTANY.

In the mean time, in tracing the origin and progress of botanical science in *Britain*, a survey of its state in the druidical times, ought to claim the first attention ; but in fact, the little information transmitted to us from the antients, relating to this extraordinary sect, being almost wholly confined to *Cæsar* and *Pliny*, precludes any enlarged view respecting my particular object. It is from *Pliny* we learn, that to the *misseltœ*, the *vervain*, the *selago*, and the *samolus*, these antient fathers of druidism attributed efficacies almost divine ; and ordained the collection, and administration of them, with rites and ceremonies, not short of religious strictness, and such as countenanced the grossest superstition.

The *misseltœ*, for instance, must be cut only with a golden knife ; must be gathered when the moon was six days old ; the priest clothed in white ; the plant received on a white napkin ; and lastly, two white bulls were to be sacrificed ; and thus con-

secrated, miffeltoe was an antidote to poison and prevented sterility *.

The *misseltoe* perhaps, is, of these plants, the only one fully ascertained at this time. Its parasitical growth, the preference which the Druids gave to that which grew on the oak, assisted by the descriptions the antients have left of it, will sufficiently justify the application to the *viscum* of the moderns. May I not add, that probably, amidst the manifold virtues antiently ascribed to this plant, its power of curing the falling-sickness, which has accompanied it almost to the present time, is the remnant of druidical use and tradition ?

The *vervain*, after previous libations of honey, was to be gathered at the rising of the dog-star ; when neither sun nor moon shone ; with the left hand only ; after describing a circle round the plant, &c. ; and thus prepared, it vanquished fevers, and other distempers ; was an antidote to the bite of serpents, and a charm to conciliate friendship †.

* *Pliny*, lib. xvi. c. 44.

† *Ib.* lib. xxv. c. 9.

With respect to this herb, the *hierobotane*, the *sacra herba* of DIOSCORIDES, although the modern botanists have now agreed to confine the term to the *verbena*, which PLINY has described, as having narrower and smaller leaves than the oak, it may be remarked, that there has been a diversity of opinions among the commentators, relating to the plant; and it is acknowledged that *verbena* or *verbenacea*, was also applied, as a general term for all plants used about the altar in sacrifices. To this day the Tuscans apply the word *vervena* to slips, shoots, suckers, or bundles of plants of any kind.

The *selago* was not to be cut with iron; nor touched with the naked hand, but with the *sagum*; the Druid cloathed in white, and his feet naked, with other magic ceremonies. Thus collected, and consecrated, it became a remedy for diseased eyes, and a charm against misfortunes*.

It is, nevertheless, equally difficult to determine the *selago* of the Druids; PLINY

* *Ib.* lib. xxiv. c. 11.

having only described it as like the *savin*; a description which will accord with a variety of plants of Europe. Most authors, nevertheless, have agreed, from this resemblance, to consider it as a species of *wolfsclaw moss*, which is now called *lycopodium selago*. CÆSALPINUS, however, thinks it was a *sedum*; and GUILANDINUS, an *erica*, or heath, and probably with more reason.

Various, but equally superstitious, were the rites attendant on the *samolus*, which was given to preserve oxen and swine from diseases.

This is a plant of which still greater doubts remain, PLINY having said nothing further of it, than that it grew in moist places. Hence the name is applied to a plant called *round-leaved brooklime*; but, as forming a separate genus in modern arrangements, it has acquired the name given as above, from *Pliny*. Others have thought it a species of *pulsatilla*, or pasque-flower; since one of that kind retains, among the Bolognese, the name of *samiglo*.

The same uncertainty attends all disquisitions relating to the *berba Britannica*, of

DIOSCORIDES

DIOSCORIDES and PLINY, famed for having cured the soldiers of *Julius Cæsar*, on the Rhine, of the *Scelotyrbe*, or the disease supposed to be our sea scurvy. The uses of this herb were thought to have been derived from the Britons; the name suggested this notion; but later etymologists have found a different derivation: i. e. Brit. *consolidare*; Tan. *Deus*, *Ica* f. *Hica*, *ejectio*; unde, *Britannica dicitur herba, quæ firmet et consolidat dentes vacillantes**. The commentators have applied the description given by those two antients, to a variety of simples. By some, it has been thought to be the *polygonum persicaria*, or spotted arsmart: by others, the *primula auricula*, or wild auricula: by our own first herbalist, TURNER, who observed it plentifully in *Friesland*, the scene of *Pliny's* observations on its effects, the *polygonum bistorta*, or bistort: at length, *Abraham Munting*, a Dutch physician, published a treatise in 1681, professedly to prove, that the *Britannica* was the *hydrolapathum magnum*, (*ru-*

* RAY. *Hist. Plant.* i. p. 172.

mex aquaticus) or great water dock. In this opinion RAY, and others, have acquiesced.

I should not have dwelt so long on these circumstances, but to shew the mortifying uncertainty attending the application of the names of plants from the antients, arising from their vague and indecisive descriptions. I add, that Mr. LIGHTFOOT thinks, there are sufficient traces in the highlands, of the high esteem in which the Druids held the quicken-tree, or mountain ash; *forbus aucuparia*. It is, more frequently than any other tree, found planted in the neighbourhood of druidical circles of stones, so often seen in Scotland. Possibly this fact may be more equivocal than the superstitious uses to which it is still applied. It is believed, that a small part of this tree carried about them, is a charm against witchcraft and enchantment. The dairy-maid drives the cattle with a switch of the *roan-tree*, for so it is called in the highlands, as a security against the same direful evils; and in one part of *Scotland*, the sheep and lambs are, on the first of May, ever made to pass through a hoop of *roan-wood*.

Short,

Short, and imperfect, as this view of Druidical Botany may be, as delivered to us by PLINY, yet there can be no doubt that the Britons, like all other rude nations, drew their medicinal sources from the simples growing around them, and, were therefore well acquainted with common plants. And, although there are not, as far as I know, any herbals extant in the antient British language, or in any translation from it, by which the degree and extent of their knowledge may be precisely ascertained; yet, as far as respects the nomenclature merely, some reasonable estimate may, I apprehend, be formed from the list of *Welsh* names of plants, preserved by GERARD, as communicated to him by Mr. *Davies* of *Guiffaney*, in *Flintshire*: from the *Irish* names, as we find them in Mr. HEATON's catalogue, printed in THRELKELD's *Synopsis*; to which I may add, the *Erse* names communicated by the Rev. Mr. *Stuart*, to the late excellent and much-lamented botanist, the Rev. Mr. LIGHTFOOT. These lists might, without doubt, be greatly amplified, by the assiduity of skilful botanists

well

well versed in the respective languages. THRELKELD's list, which is the most copious, comprehends near four hundred names; and the analogy perceivable between these and the *Erse* names, sufficiently marks a common origin. I am tempted to produce a few instances *.

SAXON

* Muiriunagh.	<i>Irish.</i>	} <i>Arundo arenaria</i> f. <i>Spartum.</i>
Muran.	<i>Erse.</i>	
Cruah Phadruig.	<i>Irish.</i>	} <i>Plantago Major.</i>
Cuah Phadruic.	<i>Erse.</i>	
Slan lus.	<i>Irish.</i>	} <i>Plantago lanceolata.</i>
Slan lus.	<i>Erse.</i>	
Cran Tomain.	<i>Irish.</i>	} <i>Sambucus.</i>
An druman.	<i>Erse.</i>	
Fraogh.	<i>Irish.</i>	} <i>Erica.</i>
Fraoch.	<i>Erse.</i>	
Feirdris.	<i>Irish.</i>	} <i>Rosa canina.</i>
An-Fhearr-dris.	<i>Erse.</i>	
Carmel.	<i>Irish.</i>	} <i>Orob. sylvaticus.</i>
Cor, Cormeille.	<i>Erse.</i>	
Tæd Coluim Kille.	<i>Irish.</i>	} <i>Hypericum perforatum.</i>
Acklasan-Challum-chille.	<i>Erse.</i>	
Meacan tovach.	<i>Irish.</i>	} <i>Arctium Lappa.</i>
Mac-an-dogha.	<i>Erse.</i>	
Liagh Lus.	<i>Irish.</i>	} <i>Artemisia vulgaris.</i>
An-liath-lus.	<i>Erse.</i>	
Gallan.	<i>Irish.</i>	} <i>Tussilago Petasites.</i>
An-gallan-mor.	<i>Erse.</i>	
Noinin, nonin.	<i>Irish.</i>	} <i>Bellis perennis.</i>
Noinein.	<i>Erse.</i>	
		} <i>Daisy.</i>

Ahair

SAXON BOTANY.

The history of *Saxon* Botany must be very short. No nations, however rude, have yet been discovered, who were so regardless of health, as not to have a knowledge of, and some dependence upon, the virtues of certain simples. There is sufficient evidence, that our Saxon ancestors did

Ahair Talham. <i>Irish.</i>	}	<i>Achillæa Millefolium.</i>
A'chaithir-thalmhain. <i>Erse.</i>		Yarrow, or Milfoil.
Sail Tovagh. <i>Irish.</i>	}	<i>Viola odorata.</i>
Sail Chuach. <i>Erse.</i>		Sweet Violet.
Beihe. <i>Irish.</i>	}	<i>Betula alba.</i>
Am-Beatha. <i>Erse.</i>		Birch-Tree.
Fearnog. <i>Irish.</i>	}	<i>Betula Alnus.</i>
Am-Fearna. <i>Erse.</i>		Alder-Tree.
Cran Darrah. <i>Irish.</i>	}	<i>Quercus Robur.</i>
An Darach. <i>Erse.</i>		The Oak.
Guifagh. <i>Irish.</i>	}	<i>Pinus sylvestris.</i>
An Guithas. <i>Erse.</i>		Wild Pine. Scotch Fir.
Soileog. Saileagh. <i>Irish.</i>	}	<i>Salix alba.</i>
Sileach. <i>Erse.</i>		Willow.
Ruideog. Raodagh. <i>Irish.</i>	}	<i>Myrica Gale ; or,</i>
Roid. <i>Erse.</i>		Sweet Myrtle.
Beecora leera. <i>Irish.</i>	}	<i>Juniperus.</i>
Beera leacra. <i>Erse.</i>		<i>Juniper.</i>
Raineagh muire. <i>Irish.</i>	}	<i>Pteris aquilina.</i>
Raineach. <i>Erse.</i>		Fern, or Brakes.
Garvogagh. <i>Irish.</i>	}	<i>Lycopodium Selago.</i>
Garbhag-an-t-sleibh. <i>Erse.</i>		Wolfs-claw Moss.
Duilleasg. <i>Irish.</i>	}	<i>Fucus palmatus.</i>
Duilleosg. <i>Erse.</i>		Sweet Fucus. Dulfe.

not

not wholly disregard this study ; since, although rare, there are manuscript Saxon herbals extant in several public libraries. The two following occur in the Bodleian :

4123. HERBARIUM. Saxonice.

5169. LIBER MEDICINALIS, *continens virtutes herbarum*. Saxonice.

I am unable to determine whether the above are the same with the two following, which Dr. *Ducarel* notices from the Harleian collection :

5066. Entitled, HERBARIUM. Saxonice.

585: *Traſtatus, qui ab Anglo-Saxonibus dicebatur* LIBER MEDICINALIS.

The laſt is ſaid to be an Anglo-Saxon verſion of APULEIUS, whom I ſhall have occaſion to mention hereafter. The date of this tranſlation is of the tenth century. The Saxons having been converted to Chriſtianity at the latter end of the fixth century, the communication between *Britain* and *Rome* became by degrees very frequent,

quent, and learning was then first introduced into these realms.

The golden age, if I may be allowed that expression, of the Anglo-Saxon learning, was the reign of ALFRED the Great. That munificent prince not only himself translated Latin authors, but, as historians inform us, encouraged in every way, the transfusion of all the knowledge of the times into the common language of the kingdom. To this æra, therefore, may reasonably be referred the Saxon version of APULEIUS; whose book seems to have preserved popularity through all the middle ages, and was found in common use at the æra of printing.

As no publication of any *Saxon* herbal has ever taken place, we are unable to define the extent of the knowledge of that time: at present, therefore, as in the instance of antient *British* Botany, we can only recur to the nomenclature of the indigenous names, by which some of them are yet known; although many others have given way to Greek and Latin terms, and some to other revolutions, occasioned by the gradual

gradual progress of reformation throughout the science in general.

A list of the *Anglo-Saxon* names would be recoverable, in a great degree, by recurring to the old herbals, to SKINNER's Lexicon, and other authorities of that kind. It would, I am persuaded, be more extensive than a superficial view might suggest, and would do credit to our Saxon ancestors. I cannot help remarking, that many mistakes have probably arisen from the neglect of our first reformers of Botany in *England*, after they had formed scientific names, in not preserving also the old and provincial terms; and that, on the whole, this neglect has retarded the progress of knowledge on this subject.

C H A P. 2.

General state of Botanical knowledge during the dominion of the Saracens—Corrupt translations of Dioscorides—Avicenna—Aschard, or Ebn Beithar, the capital Writer in Botany among the Arabians—Schola Salernitana—English Writers during the middle ages—Henry of Huntingdon—Arviel—Bray—Legle, or Gilbertus Anglicus—Ardern—Daniel—Bollar—Horman—MSS. of anonymous Authors—Translations and editions of Apuleius and Macer, in use in England at the invention of printing—Specimen of the superstition of Apuleius.

M I D D L E A G E S .

L EARNING and science follow the fate of empires. On the decline of those of Greece and Rome, and during that period in which the Saxons were establishing themselves in Britain, medical knowledge passed into the hands of the triumphant Saracens. Bagdat, under the Eastern Caliphs, became the seat of learning. Much of the Greek physic and philosophy was corruptly translated by the command of Musselmen; among whom at length it

received due reception and encouragement. Schools were established, in which ARISTOTLE, GALEN, DIOSCORIDES, and other writers, were studied ; and their doctrines at length pervaded the whole dominion of the Saracens, and finally flourished in the universities of *Spain*.

DIOSCORIDES, though in a corrupt and mutilated state, formed the basis of knowledge in the *Botany* and *Materia Medica* of the Arabians. The situation of *Bagdat*, and its connection with *India*, allowed them scope to introduce into physic several useful simples. Among others, we owe to these Orientals the milder purges of the present day ; such as *senna*, *cassia fistula*, *manna*, *tamarinds*, *rhubarb*, and several drugs of other qualities, of which some retain a place in the present reformed state of the *Materia Medica*. AVICENNA, we are told, had coloured drawings for the instruction of his pupils in Botany ; and Prosper ALPINUS assures us, he saw at *Cairo* a volume of paintings of the plants of *Ægypt*, *Arabia*, and *Ethiopia*, which had been done for the use of a Sultan.

It

It is not easy, however, to judge, with precision, of the extent of Arabian knowledge on the subject of our work; since, probably, the best book of the Arabian school has yet remained unpublished, that of *Ebn BEITHAR*. It is extant in the Parisian, the Escorial, and other libraries. This learned Arab was particularly attached to the botanical branch of physic. He was born in *Spain*; and after visiting *Africa*, travelled into the Levant, *Asia*, and even as far as the Indies, to improve his knowledge. In his return he was patronised by *Saladin*, at *Cairo*, and died in 1248.

HERBELOT informs us, that from the superiority of his learning in this branch, he was styled *Aschard*, or The Botanist. He wrote "A General History of Simples, or of Plants, ranged in alphabetical order;" in which he gives the Greek, Arabic, and vernacular names; with the descriptions of each; and particularly, in a more detailed manner, those not described by *DIOSCORIDES* and *PLINY*.

There is, notwithstanding, but little room to believe, that more original knowledge

could be derived from the Arabian monuments of science in this, than in the other departments of physic. In their best authors, even the Greek names of plants are so grossly perverted, that they are scarcely to be known.

The Grecian authors having been inaccurately translated at first, and the language neglected afterwards, physic lost much under the dominion of the Arabians. It was, in the end, a corrupt Galenic theory, with an admixture of *astrology* and superstition. In this state the learned of Europe found it, in the celebrated Moorish universities of *Spain*. In the western parts of Christendom, especially after the lapse of the Latin tongue in *Italy*, it was scarcely less obscured by the ignorance of the Monks, by whom, almost solely, the practice of it was engrossed.

Even the first university in Christendom, the renowned school of *Salernum*, founded by *Charlemagne* in the beginning of the ninth century, received its dictates from the corrupt sources of the Arabians; whose works are said to have been at length translated
into

into Latin by *Constantine* the African. The famous precepts *de Conservanda Valetudine*, issued from that school for the use of *Robert* duke of Normandy, were, without doubt, well known in England, and probably excited attention to the study of Vegetables ; concerning which, numerous rules and cautions occur in that remnant of the learning of those days.

During all these ages, the original sources in the Greek authors were almost wholly forgotten, and the productions of that long night of science were equally rare and unimproving.

I shall, nevertheless, enumerate briefly a few of those English authors, who were most conspicuous for any attention to the simples used in medicine, which alone bounded the botanical knowledge of those times.

One of our earliest writers, after the Conquest, was the historian *HENRY Archdeacon of Huntingdon*, in the time of king Stephen and Henry the IId. *Bishop TANNER* informs us, that he left a MS. in

eight Books, *De HERBIS, de Aromatibus, et de Gemmis.* Bib. Bodley. 6353.

Of nearly the same age are said to be, some manuscripts preserved in *Bibl. Regia Lond.* under the following titles, *De Natura Pecudum, ARBORUM, et Lapidum*: and one *De Naturis Herbarum.* Bishop Tanner mentions an Englishman of the name of Henry ARVIEL, who had travelled much, and resided some time at *Bologna*, about the year 1280. He left a manuscript *De Botanica, sive Stirpium Varia Historia.*

The same author notices a manuscript, in the Sloanean collection, of John BRAY, who lived in the time of Richard the IIId. He studied Botany and Physic, and received an annual pension from the king, for his knowledge and skill in these sciences. It is entitled, *Synonyma de nominibus Herbarum.* It contains the names, in Latin, French, and English.

Besides the *Compendium Medicinæ* of GILBERTUS LEGLE, or GILBERTUS ANGLICUS, who also flourished in the thirteenth century, a manuscript is recorded of

that author, under the title of *De re Herbaria*, lib. 1. and others, *De Viribus et Medicinis Herbarum, Arborum et Specierum: et de Virtutibus Herbarum*, lib. 1.

The famous English surgeon *John ARDERN* of Newark, extolled by Dr. *Friend*, as the reviver of surgery in England, who flourished soon after *John* of GADDESSEN, in the middle of the fourteenth century, left a manuscript, which is in the Sloanean library, under the title of *De re Herbaria, Physica, et Chirurgica*.

Henry DANIEL, a Dominican friar, said to be well skilled in the natural philosophy and physic of his time, left a manuscript inscribed *Aaron Danielis*. He therein treats *De re Herbaria, de Arboribus, Fructibus, &c.* He flourished about the year 1379.

Appertaining to my subject I also mention, a treatise, written, as is supposed, in the time of Edward the III^d. by *WALTER de HENLEY*, entitled, *De Yconomia sive Houſbrandia*; in which, Bishop *Tanner* says, he has treated his subject well, according to the usage of the time.

NICOLAS BOLLAR, educated at *Oxford*,

whom TANNER represents as eminent for his knowledge in natural philosophy, wrote *De Arborum Plantatione*, lib. 3. *De Generatione Arborum et modo Generandi et Plantandi*, lib. 2. and other tracts now in manuscript.

There is a manuscript said to be preserved in Baliol college, written by JOHANNES de S. PAULO, *De Virtutibus Simplicium Medicinarum*. The age of these two last is not sufficiently ascertained; neither is that of a manuscript in Caius and Gonville college, Cant. entitled *Cinomia* (Synonymia) *Herbarum*.

The following authors, who wrote, at least prior to the introduction of printing into England, are enumerated, by Bishop Tanner, and others.

Henricus CALCOENSIS, a prior of the Benedictine order, is said, by *Dempster*, to have travelled into *France*, *Germany*, and *Italy*, solely to enjoy the conversation of the learned. He wrote *Synopsis Herbaria*, Lib. 1. and translated *PALLADIUS de re Rustica*, into the Scottish tongue, about the year 1493.

William

William HORMAN, a native of *Salisbury*, was educated at Winchester school, and became a perpetual fellow of New College in 1477. In 1485 he was chosen school-master and fellow of Eton, and at length elected vice-provost of the same college. He was a man of extensive and various erudition. Among numerous productions, he left a book under the title of *Herbarum Synonyma*. He wrote indexes to the antient authors *De re Rustica*: to *Cato*, *Varro*, *Columella*, and *Palladius*. After several years of retirement, he died in 1535, and was buried in the chapel of the college.

The writers, and the age, of the two following manuscripts, are unknown.

Liber de Herbis, in the library of Corpus Christi.

Nomenclatura Vocabulorum in Medicina receptorum, præsertim etiam Herbarum; in the library of Magdalen college.

The underwritten, without any author's names, are in the Ashmolean library, with the annexed dates.

Diverse physical receipts with an Herbal, 1438, N° 7704.

AN HERBAL, Alphabeticum, 1443, N° 7709.

AN HERBAL, in old English, 1447, N° 7713.

Physical Plants, English, 1481, N° 7724.
Also,

A description of some simples—In the Bodleian library, N° 2073.

Exclusive of many others, more strictly medical, the under-written * anonymous manuscripts, though the dates have not been precisely determined, are, with good reason, supposed to have been written, if not prior to the invention of printing, at least before the introduction of that art into England.

This

* In the Bodleian library.

2543. *Anonymus, de Arboribus, Aromatis, et Floribus.*

2062. *An Herbal.*

2562. *Glossarium Latino-anglicum Arborum, Fructuum, Frugum, &c.*

2335. *Nomina Herbarum, Latine, Gallice, Anglice.*

2257. *Concerning the Virtue of some Herbs.*

2072. *De sedecim Herbis et earum Virtutibus.*

1798. *Herbarium.*

This list, perhaps already too long, might have been considerably extended, but that it would have unnecessarily swelled this article. As none of these manuscripts, however, have been published, the exact state and progress of the science cannot be ascertained; yet enough is seen to convince us, that, although its advancement was slow and inconsiderable, it was not wholly lost in the darkness of that night, which, for so many ages, obscured the sources of knowledge. It is highly probable, that
very

- 3828. *Herbarium Anglico-latinum alphabeticum,*
- 6206. *De Plantis admirandis.*
- 2073. Description of some Simples.
- 2626. *Lexicon Medicamentorum Simplicium.*

In the Ashmolean library.

- 7762. *Alphabeta de diversis Nominibus Herbarum.*
- 7541. *De Naturis quarundam (animatum) Arborum,*
 &c. cum Iconibus pictis.
- 7778. *Catalogus Plantarum, additis, subinde, Nominibus Anglicis.*
- 1397. *De Dieta Salutis, et Catalogus Plantarum.* Lat.
 Angl.
- 7634. "An alphabetical Catalogue of Plants."
- 7537. "A Book of Plants, delineated in their natural
 Colours."
- 7694. "Alphabetical Catalogue of Plants."

In

very few of the manuscripts before enumerated, exhibit any considerable portion of original matter; but, that they are principally extracts and compilations, from preceding writers of the lower age; such as, *Apuleius*, *Æmilius Macer*, *S. Sethus*, *Ifidore*, *Constantinus*, the *Pandects* of *Matthew Sylvaticus*, *Platearius*, some of the later Arabians, and other writers of that stamp. At the renovation of knowledge just mentioned, these appear to have been the primary sources from which our ancestors of that generation derived assistance; since we find many MSS. of the above au-

In other collections the following :

- 976. *Traëtatus de Herbis.* Bibl. Caj. Gonv. Cant.
- 8875. "The Book of Simples; or a Treatise of Herbs and their Virtues." Sloan.
- 1747. *De Herbis et Plantis.* Coll. John. Bapt. Oxon.
- 1695. *Notabilia de Vegetabilibus et Plantis,* Bib. S. Petri Cant.
- 844. *Nomina Herbarum, earumque Vires.* Bib. Caj. Gonv.
- 8738. *Nomina Herbarum, et de earum Proprietatibus.* Sloan. an? idem cum priori.
- 959. *Alphabetum Herbarum, cum Synonymis,* Bib. Caj. Gonv.
- 8746. *Des Propriétés et Noms des Herbes.*

thors

thors were in being, at the origin of printing, and were early issued from the press as the manuals of that day, in various parts of Christendom.

It has been observed, that the last-mentioned Saxon manuscript, was a translation of *Lucius APULEIUS Madaurensis*; whose work, from several other circumstances, there is room to believe, was, at that time, more diffused and popular in *England*, than any other. This author, who lived in the age of the *Antonines*, was born at *Madura* in *Africa*, at that time a seat of learning. He afterwards studied at *Carthage*, and at *Athens*, and for some time applied himself at *Rome* to jurisprudence, but at length quitted it, and devoted himself wholly to philosophy and physic. He is well known as the author of the *Milesian Fables*, and other works of learning. His book *De Herbis, sive de Nominibus ac Virtutibus Herbarum*, alone comes under our cognizance: In this he recites the names of medicinal herbs, in the Greek, Latin, Egyptian, Punic, Celtic, and Dacian, and of some in the oriental languages.

These

These names form the bulk of the book, which consists of one hundred and thirty chapters. After each name follows a short description of the plant, the place of growth, and the properties. Then the diseases to which each simple is applicable. The work nevertheless abounds with gross errors in the names of plants, and inculcates the most absurd ceremonies and superstitions in the administration of remedies ; yet it was in much esteem throughout the dark ages of literature.

It must not however be concealed, that some of the learned have judged, that this work, at least as it now appears, was not written by the author whose name it bears, but at a much later period. JOHNSON, the editor of *Gerard*, imagined it to be a translation of a Greek writer of the eighth century ; but his conjecture is not thought probable by *Fabricius* *. The remarks of *Johnson* prove, that this work was in common use in the ages I have spoken of ; and that the copies had been greatly corrupted and mutilated, by ignorant hands.

* *Bib. Latin. ab Ernesto. Lips. 1774, tom. 3. p. 44.*

I will give one instance from APULEIUS, of that credulity and superstition, which, sanctioned by antiquity, yet prevailed in the administration of remedies; and exhibits a melancholy proof of the wretched state of physic, which, through so many ages, had not broke the shackles of druidical magic and imposition. As a cure for a disease, called by the French *Nouè l'Equillette*, you are directed to take seven stalks of the herb *lion's-foot*, separated from the roots; these are to be boiled in water in the wane of the moon. The patient is to be washed with this water, on the approach of night, standing before the threshold, on the outside of his own house, and the person who performs this office for the sick, is also not to fail to wash himself. This done, the sick person is to be fumigated with the smoke of the herb *Aristolochia*, and both persons are then to enter into the house together, taking strict care not to look behind them while returning; after which, adds the author, the sick will immediately become well.

A book under the name of MACER'S
Herbal,

Herbal, seems also to have been in common use in *England*, before the æra of printing. Authors do not allow it to be the production of *Æmilius MACER* quoted by *OVID*, but of much later date, and by some it is ascribed to *ODO*, or *ODOBONUS*, a physician of the later times, and probably a Frenchman. This barbarous poem is in leonine verse, and is entitled *De Naturis, Qualitatibus, & Virtutibus Herbarum*. Divers manuscripts of it are extant in the English libraries; as, at *Cambridge*, in the *Bodleian*, *Asmolean*, and *Sloanean* collections.

It was translated into English, as Bishop *TANNER* informs us, by *John LELAMAR*, master of *Hereford* school, who lived about the year 1373. His manuscript is referred to as in *Sloane's* library. Even *LINACRE* did not disdain to employ himself on this work. "MACER'S HERBAL practysyd by
" Doctor Linacro, translated out of Latin
" into English, London, 12mo." *AMES* mentions an edition of it printed in 1542; and *Palmer*, one without date, printed by *Wyre*. This jejune performance, which is written wholly on Galenic principles,
treats

treats on the virtues of not more than eighty-eight simples.

I shall not detain the reader by dwelling on other authors of this class, whose names I have before recited ; it will be sufficient to observe, that, fettered as were the theories of this time with astrology, and a strange mixture of the Galenic doctrine of the four elements; it extended its influence, not to the human body alone, but to all the instruments of physic. Not even a plant of medicinal use, but was placed under the dominion of some planet, and must neither be gathered, nor applied, but with observances that favoured of the most absurd superstition.

C H A P. 3.

Manuscripts of the Patres Botanici scarce in England—Restoration of ancient knowledge, by the publications of Pliny, Dioscorides, and Theophrastus—The æra of commentators—Rise of true investigation by Brunfelsius, Tragus, Cordus, and Gesner—Famous MS. of Dioscorides, with illuminated figures.

M I D D L E A G E S.

AT this time manuscripts of THEOPHRASTUS, DIOSCORIDES, and PLINY, were not only exceedingly rare throughout Europe, but those of the two former were unnoticed through ignorance of the Greek language; otherwise we cannot suppose our ancestors could have neglected them, for the crude and barbarous works which have been mentioned. It was not till the opening of the fifteenth century, that opportunity was given to recur to these repositories of antient lore. The flight of the Greeks into *Italy*, at the subversion of the Eastern Empire, and the subsequent invention

invention of printing, by bringing to light, and disseminating the purer remains of *Greece* and *Rome*, at length broke the chains of barbarism and superstition, which, during so many ages, had tyrannized over the understandings of mankind.

On this happy revolution, Botany, with other sciences, revived, and presently resumed another appearance. The publication of the *Patres Botanici* raised, at once, a spirit of emulation to investigate the subjects of their works.

PLINY was first printed, if not at *Verona*, in 1468, as is affirmed by some, and doubted by others, at least in the succeeding year, at *Venice*; and the avidity with which it was received, is manifested by the numerous impressions of it, before the end of that century.

DIOSCORIDES came forth first at *Cologn*, in a Latin translation, in 1478, and in the original, by *Aldus*, in 1495. It was afterwards published in Latin by HERMOLAUS BARBARUS and RUELLIUS, in the year 1516; by VERGILIUS, in 1518; and by CORNARUS in 1529. The learned now

prefer the edition with a translation by SARACENUS, printed at *Lyons* in 1598.

THEOPHRASTUS was first printed in Greek at *Venice*, without date, and by *Aldus*, in 1495 and 1498. He was translated into Latin by GAZA in 1483, and this version has been preferred by succeeding writers.

The restoration of these sages of antiquity, immediately raised up a numerous set of commentators. Every plant was sought for, and every plant was discovered; in the works of antiquity. No drug used in medicine was esteemed *true*, unless found in DIOSCORIDES. *Scaliger* wrote animadversions on THEOPHRASTUS in 1566; in which he has corrected the version of *Gaza* in many places. Robert *Constantine* produced the parallel places in PLINY; and BODÆUS à STAPÉL, in 1644, astonished the world, by a display of erudition on this author, in which he exhausted all farther disquisition, by the profusion of his remarks, and collations, from all preceding writers.

The commentaries on DIOSCORIDES have been more numerous. The *Corellaria*
of

of HERMOLAUS BARBARUS was published in 1492. To *Hermolaus* succeeded BRUNSFELSIUS, *Petrus Leydenfis*, LACUNA, AMATUS LUSITANUS, Robert CONSTANTINE, Val. CORDUS, and several others; and finally MATTHIOLUS, whose work has superseded the rest. It was first printed in 1554, and passed through seventeen editions. If we may believe one of the correspondents of this author, thirty-two thousand copies had been sold before the year 1561*. The best edition, with the accessions of CASPAR BAUHINE in 1598, still finds a reputable place in modern libraries.

Among the illustrators of PLINY, *Hermolaus Barbarus* in 1492 stood foremost. His *Castigationes Plinianæ*, were published in 1492, in which he successfully corrected the text; and LEONICENUS, in the same year, was the first who employed critical knowledge on this author. The corruptions of the text afforded great scope afterwards to GALENIUS, RHENANUS, PIN-

* MATTHIOL. *Oper. Omn.* Ed. 1674, in *Epist.* p. 150.

TIANI, and others. The *Exercitationes Plinianæ* of SALMASIUS, are well known. Those of the laborious and paradoxical HARDUIN, are the principal resort of modern times.

It is a mortifying reflexion in the annals of human knowledge, that the bulk of these learned men, after their immense labours, mistook, in numberless instances, the road to truth, and did but perplex the science they wished to enlighten. The descriptions of plants in the antient authors, were, at best, short, vague, and insufficient; and with this inconvenience, the study of nature herself was neglected. In the mean time, there arose a genuine set of cultivators, who, discovering this error of the commentators, studied plants in the fields, where alone the best comments could be made. As the foremost of these, stands BRUNSFELSIUS. He was followed by TRAGUS, FUCHSIUS, *Val.* CORDUS, GESNER, CÆSALPINUS, and above all CLUSIUS, to whom must be added our own countryman TURNER. Still, even among these genuine restorers of natural knowledge, many did
not

not sufficiently recollect, that all the plants of DIOSCORIDES, were not those of *Europe*, but principally those of *Asia*; whilst, instead of traversing the fields of *Greece*, *Cilicia*, and the East, they were straining all the descriptions of this author, to accommodate them to the vegetables of *Europe*. It is not strange that their endeavours were but little successful. Even, after the labours of RAUWOLF, who traversed *Syria*, *Mesopotomia*, *Palestine*, and *Ægypt*, in the sixteenth century, and those of the enlightened TOURNEFORT in the present, it does not appear, that of the seven hundred plants in the *Materia Medica* of DIOSCORIDES, more than four hundred, at the farthest, are properly ascertained at this time.

We learn from PLINY (lib. 25. c. 2.) that there were paintings of plants in his day; but he complains, that, through the inaccuracy of copiers, they were not to be depended on. SALMASIUS tells us, he inspected a Greek MS. of DIOSCORIDES more than a thousand years old, in which the plants were figured with sufficient elegance indeed, but with little regard to truth

and exact resemblance. There are now existing several manuscripts of DIOSCORIDES, with illuminated figures, particularly the famous one in the imperial library at *Vienna*, of which LAMBECIUS treats largely.

It was procured by *Busbequius*, the emperor's resident at *Constantinople*, about 1560; and is said to have been copied at the expence of JULIANA ANICIA, daughter to the emperor *Flavius Anicius Olyber*, about the year 492. It has been regretted by some of the learned, that this MS. had not been brought earlier into *Europe*; by which means the commentators might have been saved much trouble. Antient, however, and splendid as this is, it may justly be doubted, whether the publication of it would have much conduced to the restoration of ancient Botany, and *Materia Medica*; since, if we are allowed to judge of the figures, from the specimens copied by DONÆUS, nothing can exceed the rudeness of them, or more strongly justify the remark of *Salmasius*. And as several of these are copied into GERARD's Herbal, for the
satisfaction

satisfaction of the curious, I refer in the note* to some of these figures in both authors.

In justice, however, to these valuable remains, it must be observed, that, from later information, we find, there is, besides this *Constantinopolitan* MS. which is in folio, another, supposed to be more ancient, in 4to. which is distinguished by the name of *Neapolitan*: that the figures in both these agree extremely well; and, as *Haller* informs us, are sufficiently exact to enable the botanical traveller, with such drawings in his hands, to distinguish the plants of *Dioscorides* in the native places of growth. It is particularly specified, that the *periclymenum* of these manuscripts evidently ap-

* *Coronopus*. Dod. ed. 1583. p. 109. Ger. em.

1190.

Arction. Dod. 849. Park. 1374.

Hyssopus. Dod. 286.

Hippophaës. Dod. 373.

Aconitum Lycoctonum. Dod. 437. Ger. em. 972.

Stæbe. Dod. 123. Ger. em. 731.

Lotus Sylvestris. Dod. 562.

Lotus Ægyptia. Dod. 563.

Tithymalus Dendroides. Dod. 368. Ger. em. 501.

pears

pears to be the *convolvulus major* of the moderns; and the *telepbium*, the *cerintbe minor*. Finally, that if those enumerated in the note so ill express the plants designed, it must be wholly attributed to the fault of the copier or engraver. This intelligence is attended with regret, when we further learn, that after some of these icons were lately engraved, with a view to the publication of the whole, the design has been laid aside.

I shall be thought, perhaps, in the foregoing pages, to have digressed too much. I have to allege, that a brief view of the general state and progress of physic, with which my subject is inseparably connected, during the dominion of the Saracens in the East, and in the ages of ignorance preceding the fourteenth century in the West, seemed necessary in order to throw light on the introduction of it into this island. And as *England* shared the improvement arising from the restoration of ancient knowledge, a short notice of the three principal botanic authors was deemed not less proper,

At

At this distance of time, perhaps it may require some warmth of imagination, to picture to the mind that satisfaction, which ingenuous and learned men must have experienced, who lived when the veil was removed, which for ages had obscured and confined those elegant sources of intellectual enjoyments, which the writings of the ancients display ; when the means of attaining them were, by the invention of printing, so happily amplified, and the progress, not only of those arts and sciences which embellish, but of those which also dignify human nature by their utility, was no longer retarded.

C H A P. 4.

Account of the earliest Botanical publications on the Continent—The Book of Nature—The Herbarius—The Hortus Sanitatis—These works the basis of the “Grete Herbal” in 1516; the first Botanical publication in England—Account of that work—Ascham—Copland, both herbalists of the astrologic sect—First Botanical gardens.

HORTUS SANITATIS,

IT was not till several years after the æra of printing, that any original work, strictly botanical, made its appearance, even on the continent; and still longer before *England* produced any publication of importance in that way.

Previous to the first dawning of this science in *England*, it is almost necessary to mention some of the productions abroad, as they were the basis of what was here first published, although, in fact, there was no original work before the *Herbal* of TURNER.

In the opinion of SEGUIER, the first book on plants, with figures, was printed

at

at *Augsburgh*, soon after the invention of wooden cuts, or tables, between the years 1475 and 1478, in the German tongue, with the title of “*The Book of Nature.*” It treats of animals and plants; of the latter, a hundred and seventy-six kinds are noticed, and many of them figured. The work is made up chiefly from *PLINY*, *Isidore*, and *Platearius*.

This book seems to have been soon superseded by the famous Herbal of *Mentz*, in 1484, stiled simply “*HERBARIUS*,” which gave rise, the next year, to the well-known work *ORTUS SANITATIS*, ascribed to *CUBA*, a physician of *Augsburgh*, and afterwards of *Frankfort*; who, if not the author, was at least the editor of an enlarged and improved edition. This work, under different editors, was the basis of all the *Herbals* of *Europe*, for many years.

Its object is the *Materia Medica* from all nature; but vegetables occupy the greater part. The first edition was comprised in four hundred and thirty-five chapters: in one, printed at Venice in 1511, which is in the black letter, they are extended to a thousand

thousand and sixty-six; of which, one half treat on the vegetable kingdom. The author professes to have drawn his resources from HIPPOCRATES, GALEN, PLINY, AVICENNA, SERAPION, MESUES, DIOSCORIDES, PLATEARIUS, VINCENTIUS, the *Pandects*, PALLADIUS, CONSTANTIN, ALMANSER, and others. At the head of each chapter stands a cut, than which, scarcely any thing can be conceived more rude; and, in some cases, nothing is more puerile or ridiculous. The pages, if printed with numbers, would amount to more than seven hundred. Many copies of this performance are remaining, although the *Herbarius* is become very scarce.

GRETE HERBAL.

These books were undoubtedly the foundation of the first printed botanical work of any consequence; or popularity in *England*; and which appeared under the title of "The GRETE HERBAL, with cuts;" printed for *Peter Treveris*, as *Ames* tells us, in 1516. Before the impression of this book in *England*, some editions of the "*Herbarius*,"

rius," on the continent, had been augmented so far as to contain five hundred figures of plants. The "Grete Herbal" seems to have been well received in *England*, since there are subsequent copies, which bear the following dates; 1526, 1529, 1539: and in the Continuation of *Ames*, an edition is mentioned of the "Great Herbal," about the year 1550, "without the cuts." There is also an edition of this book so late as the year 1561, which is ten years after the date of TURNER'S "Herbal." That of 1526 bears the following title:

"*The GRETE HERBALL whiche geueth parfyte knowledge & understanding of all manner of Herbes and there gracysous vertues which God hath ordeyned for our prosperous welfare & helth, for they hele and cure all manner of dyseases & sekenesses that fall or misfortune to all manner of creatoures of God created, practysed by many expert and wyse masters, as AVICENNA and other &c. And it geueth full parfyte understanding of the booke lately prented by me (Peter Treveris) named the noble experiens of the vertuous hand-*

bandwarke of Surgery." Imprinted at London in Southwarke by me Peter Treveris; dwelling in the Sign of the Wodows. 1526: the 27th day of July:

This volume is of the small folio form; and if printed with numbered pages, would make three hundred and fifty, exclusive of the Preface and Index. It includes the animal, vegetable, and mineral substances; used in medicine; and is said in the Introduction to be "compyled, composed, and "auctoryfed by divers and many noble Doctors and expert Maysters in Medycynes; "as *Avicenna, Pandeſta, Conſtantine, Wilhelmus, Platearius, Rabbi Moyses, Johannes Meſue, Haly, Albertus, Bartholomeus;* "and more other; &c."

There is no author's name to it; but there are indubitable traces of its being fabricated from the *Hortus Sanitatis*; and probably from the French translation of that work, printed by Caron; at Paris, in 1499; with some alterations and additions.

It abounds with the barbarous and misspelt names of the middle ages, and is undoubtedly the work which TURNER refers to

to in the Preface to his "Herbal," where he observes, that, "as yet there was no English Herbal but one, al full of unlearned cacographees, and falsely naming of herbs."

The general order is that of the alphabet, according to the Latin names, each subject forming a chapter, in the whole five hundred and five; of which, more than four hundred respect the vegetable productions; and of these one hundred and fifty bear the names of plants which are natives of *England*: but the writer remarks no other distinction, by which they are known from the exotics. The names are given in Latin and English, but throughout the whole scarcely any descriptions. The qualities, whether *hot* or *cold*, *dry* or *moist*, according to the Galenic mode of the time, is invariably noticed, followed generally by a prolix account of the diseases to which the plant is applicable, and the method of using it.

To each is prefixed a coarse wooden-cut figure, as in the *Hortus Sanitatis*, from
VOL. I. E which,

which, on a somewhat smaller scale, they are evidently copied; consisting generally of outlines only. Each block is two inches high, and nearly as wide. Many of these figures are fictitious, and many misplaced. In a variety of instances the same figure is prefixed to different plants, and in very few are they sufficiently expressive of the habit, to discriminate even a well-known subject, if the name applied did not suggest the idea of it. In some, these icons are whimsically absurd, especially in the animals and minerals, being also copies of those in the *Hortus Sanitatis*. Those of the *Mandrake*, for example, exhibit two perfectly human figures, with the plant growing from the head of each; though, to do the writer justice, he acknowledges, that no such thing exists in nature. At the end is subjoined, "an explanation of some terms;" and "a tract on urines."

ASCHAM.

Anthony ASCHAM, a priest, and vicar of *Burnishton* in *Yorkshire*, to which he was preferred

preferred by *Edward VI.* after a liberal education, which it might have been expected would have secured him from such delusion, gave himself up to the study of astrology, on which subject he published several tracts. He wrote also "on the Leap Year;" and the following :

" A LYTTTEL HERBAL of the properties of Herbs, newly amended and corrected, with certain additions at the end of the booke, declaryng what herbs hath influence of certain starres and constellations, whereby may be chosen the best and most lucky times and days of their ministration, according to the Moon being in the signs of heaven, the which is daily appointed in the Almanack; made and gathered in the year M.D.L.xii Feb. by ANTHONY ASCHAM, Physician." Lond. 1550. 12°.

C O P L A N D.

I am not able to ascertain the exact date of the underwritten, published by *William Copland*, a London printer.

" A Booke of the Properties of Herbs, called an Herball; whereunto is added the

“ tyme that Herbes, Flowrs, and Seeds
 “ should be gathered, to be kept the whole
 “ yere, with the Virtue of Herbes when
 “ they are stilled. Also a general Rule of
 “ all manner of Herbes, drawn out of the
 “ auncient Book of Physick by W. C.”
 London, by W^m Copland. 12mo.

BOTANICAL GARDENS.

The revival of Botany, and the consequent establishment of professorships, gave rise to Botanical gardens; a new species of luxury in horticulture, of singular emolument to science. The history of antient gardens, hitherto not sufficiently illustrated, merits the investigation of the most learned and able writer: of the pen of a RAPIN, a MEURSIUS, a SEGUIER, or a GRONOVIVS. We learn, however, that even *Botanical* gardens are of antient date. If it may be credited, what is related of ATTALUS, the last king of *Per-gamus*, who from his love of physic has been stiled the physician, he collected in his garden *bellebore*, *benbane*, *aconite*, and other poisonous herbs, to make experiments on criminals with counter-poisons. *Crete*, from

the earliest times renowned for the production of medicinal herbs, was the physic-garden of *Rome*. The Emperors, we are told, maintained in that island, herbarists, and gardeners, to provide the physicians of *Rome* with simples. *Castor*, a Greek, praised both by *PLINY* and *GALEN*, is said, not only to have written many volumes concerning plants, but to have had a garden at *Rome*, in which, *PLINY* relates, that *CAS-TOR*, at upwards of an hundred years of age, demonstrated plants, and taught him to distinguish several rare and useful species.

The utility of these institutions are self-evident. By public gardens, medicinal plants are at the command of the teacher in every lesson. By private ones, the eye, and the taste of the opulent and scientific owner, is perpetually gratified with the succession of curious, scarce, and exotic luxuries; in comparing the doubtful species, and examining them through all the stages of growth, with those to which they are allied. Add to which, that all these advantages are accumulated in a thousand ob-

jects at the same time. The first public institution of this kind, in more modern times, was that of *Padua* by the Venetians, in the year 1533. LUCAS GHINUS, the first public professor of Botany in *Europe*, was a strenuous promoter of the same designs; and by his influence procured the establishment of a garden at *Bologna*, in 1547, where TURNER himself imbibed much of that knowledge, which afterwards gave him such pre-eminence in his own country.

Among the earliest private gardens of the same kind, was that of EURICIUS CORDUS, the disciple of the venerable LEONICENUS, and of MANARDUS, two of the first commentators who displayed true Botanical criticism, on the works of the antients, CORDUS shewed himself afterwards worthy of such masters. In his *Botanologicon*, printed in 1534, he mentions his own garden, and that of NORDECIUS at *Cassel*. About the same time there were several opulent patrons of this science in *Italy*, *Germany*, and *France*, who followed this example. GESNER constructed a garden at *Zurich* in

1560 ; the first of the kind in *Switzerland*. He not only delineated plants himself, but maintained, at his own expence, a draughtsman and engraver, for the same purposes. TURNER appears to have had a garden for rare plants, even during his residence at *Cologne*. In *England* he records the garden of the duke of *Somerset*, at *Sion House*, of which he seems to have had the direction ; and, at a later period, as hath been before observed, mentions also his own at *Wells*.

C H A P. 5.

Turner — *Anecdotes of his life* — *Account of his writings preceding the Herbal* — *His Herbal : the first original book of Botany, published in England* — *An account of that work* — *Contemporary Botanists mentioned by TURNER, as Falconer, Wooton, Merdy, Clement* — *Turner's book on baths* — *Turner not sufficiently appreciated by succeeding Botanists.*

T U R N E R,

THE history of English Botany to this period, from its imperfect, and even barbarous state, may perhaps not unaptly be considered as the fabulous age of the science among us. But we are now arrived at the true Era of its birth in *England*. I cannot call it the restoration, since this nation, like *Italy* in the flourishing state of *Rome*, had never been enlightened by the writings of *Greece*. It was much later before the works of those sages reached this kingdom. Manuscript copies of the *PATRES BOTANICI*, as hath been before observed, were

were exceedingly rare ; and the language itself in which they are written, had made small progress in *England*.

On this head, indeed, my sources of information are very narrow ; as far as they reach, I am not able to find, that one manuscript of THEOPHRASTUS existed at this period, in any of the public libraries of *England*. Of DIOSCORIDES, there are two MSS. in the *Bodleian*, N° 3637, which bear the title of “ *De Herbarum Natura et Virtutibus, cum Iconibus elegantibus.*” And in the same collection, N° 840, an Arabic version of the five books, *cum Nominibus à Thoma Hyde adjectis*. Of PLINY, there is said to be an entire copy in *Baliol* library, N° 279 ; an imperfect one, of eighteen books only, in the *Norfolk* collection, N° 2996 ; and an epitome, in *Trinity-college, Cambridge*, N° 459.

Even of the works of HIPPOCRATES, scarcely any were known except his *Aphorisms* and *Prognostics* ; and *Linacre* first made the English physicians acquainted with GALEN. But to return ; the true Era of Botany in *England*, must commence with

with Dr. *William* TURNER, who was unquestionably the earliest writer among us, that discovered learning and critical judgment in the knowledge of plants; and whose "Book of Herbs," as Dr. BULLEYN observes, "will always grow green, " and never wither as long as *Dioscorides* is "held in mind by us mortal wights." But, before I turn my attention to TURNER, I will remark, that, in an interval of thirty-four years between the first edition of "The Grete Herbal," in 1516, and that of TURNER, in 1550, I have it not in my power to refer to any publication on my subject, in the English tongue. That there were translations of several of the writers of the middle ages, has been noticed. Among those, on the continent, there were several by whose means Botany made a rapid progress. The principal were BRUNSFELSIUS, EURICIUS CORDUS, RUELLIUS, *Valerius* CORDUS, FUCHSIUS, and above all GESNER, who, possessing a genius and industry, almost unparalleled in these studies, comprehended this rising branch of knowledge, with a more expanded view than any of his predecessors,

predecessors, and extended its bounds beyond the limits, which, till that time, *Materia Medica* alone, had prescribed to it. But GESNER's talents, though in Botany they were original, were still more conspicuous in his knowledge of the animal kingdom, in which, his writings will long be valued and esteemed, by those especially, who, without painful researches, would see ancient literature in a concentrated view. I speak not of his abilities as a philologist and critic, in which characters he held a distinguished place. But to proceed,

WILLIAM TURNER was born at *Morpeth* in *Northumberland*, and educated at *Pembroke college, Cambridge*, under the patronage and assistance of *Sir Thomas Wentworth*. I find him a student of that college about the year 1538, where he acquired great reputation for his learning. He applied himself to philosophy and physic, and early discovered an inclination to the study of plants, and a wish to be well acquainted with the *Materia Medica* of the ancients.

He complains of the little assistance he
could

could receive in these pursuits. “ Being
“ yet a student of Pembroke hall, whereas
“ I could learn never one Greke, neither
“ Latin, nor English name, even amongst
“ the physicians, of any herbe or tree : such
“ was the ignorance at that time ; and as
“ yet there was no English Herbal, but one
“ all full of unlearned cacographies and
“ falsely naming of herbes.”

At *Cambridge*, TURNER imbibed the principles of the reformers, and afterwards, agreeably to the practice of many others, united, to the character of the physician, that of the divine. He became a preacher, travelling into many parts of *England*, and propagated, with so much zeal, the cause of the reformation, that he excited persecution from Bishop *Gardiner*. He was thrown into prison, and detained a considerable time. On his enlargement, he submitted to voluntary exile, during the remainder of the reign of *Henry VIII*.

This banishment proved favourable to his advancement in medical and botanical studies ; he resided at *Basil*, at *Strasburgh*, at *Bonn* ; but principally at *Cologne*, with
many

many other English refugees. He dwelt for some time at *Wiessemburgh*; he travelled into *Italy*, and took the degree of Doctor of Physic at *Ferrara*. As, at this period, the learned were applying with great assiduity to the illustration of the antients, it was a fortunate circumstance to Dr. TURNER, that he had an opportunity of attending the lectures of *Lucas GHINUS*, at *Bologna*, of whom he speaks in his "*Herbal*" with great satisfaction; and frequently cites his authority against other commentators. GHINUS was the first who erected a separate professorial chair for Botanical science; from whence he gave lectures on *Dioscorides*, which he continued for twenty-eight years with great applause. He procured the physic-garden to be founded at *Bologna*, to demonstrate the plants he spoke of. He was the preceptor of *CÆSALPINUS* and *ANGUILLARA*, who became two of the soundest critics in the knowledge of plants, that the age produced. TURNER resided a considerable time at *Basil*, from which place he dates the dedication of his book "*On the Baths of England and Germany.*"

“Germany.” During his residence in *Switzerland*, he contracted a friendship with *GESNER*, and afterwards kept up a correspondence with him.

GESNER had a high opinion of *TURNER*, as appears by the following passage in his book *De Herbis Lunariis*, printed in 1555. “*Ante annos 15, aut circiter cum Anglicus ex Italia rediens, me salutaret (TURNERUS) is fuerit vir excellentis tum in re medica tum aliis plerisque disciplinis doctrina, aut alius quispiam vix satis memini, &c.*”

At the accession of *Edward VI.* he returned to *England*, was incorporated Doctor of Physic at *Oxford*, appointed Physician to *Edward Duke of Somerset*, and, as a divine, was rewarded with a Prebend of *York*, a Canonry of *Windfor*, and the Deanery of *Wells*. He speaks of himself in the third part of his *Herbal*, when treating on the *herba Britannica*, which he took to be the Bistort, as having been physician to the “*Erle of Embden, Lord of East Friesland.*” In 1551 he published the first part of his history of plants, which he dedicat-

ed to the duke, his patron. His zeal in the cause of the reformation, which he had amply testified by several religious tracts, induced him to retreat to the continent, during the whole reign of *Mary*. At her decease, Queen ELIZABETH reinstated him in all his church preferments. In the dedication of the compleat edition of his "Herbal" to the queen, in 1568, after complimenting her majesty on account of her skill in the Latin language, and the fluency with which she conversed in it, he acknowledges with gratitude, her favours in restoring him to his benefices, and in other ways protecting him from troubles ; having, at four several times, granted him the great seal for these purposes. He seems to have divided his time between his deanery, where he had a Botanical garden, of which frequent mention is made in his "Herbal," and his house in Crutched Friars, *London*. He also speaks of his garden at *Kew*. From the repeated notices he takes of the plants in *Purbeck*, and about *Portland*, I should suppose he must have had some intimate connections in *Dorsetshire*.

Dr.

Dr. TURNER died July 7, 1568, a few months after the publication of the last part of his "Herbal." He left several children: his son *Peter* was educated to physic, travelled, and took degrees abroad; was incorporated doctor at *Cambridge*, and at *Oxford*; and died aged 72, in 1614; but I do not find that he inherited his father's turn to Botany.

TURNER's first work on the subject of plants, if BUMALDUS is not mistaken, was printed at *Cologne*, under the title of "*Historia de Naturis Herbarum Scholiis et Notis vallata.*" Colon. apud Gymnicum 1544. 8°. Bumaldus is the only writer, in whom I find any mention of this book; and I suspect, it was not republished in *England*. It was followed by a small volume under the title of "NAMES OF HERBES, in Greek, Latin, English, Dutch, and French." Lond. 12°. 1548. This nomenclator is, I believe, become very scarce; since it has not yet found its way into the copious and magnificent collection of Sir *Joseph Banks*.

Dr. TURNER's knowledge in natural history was not confined to Botany; his earliest publication

publication appears to have been, a treatise on birds, under the following title :

“ Avium præcipuarum quarum apud Plinium et Aristotelem mentio est brevis et succineta historia, ex optimis quibusque scriptoribus contexta. Scholio illustrata et aucta. Adjectis nominibus Græcis, Germanicis, et Britannicis.”

Coloniæ 1543. 8°. Not having seen this volume, I can only say, that TURNER is mentioned by his friend GESNER, in respectful terms, as an ornithologist. *“ Avium quidem nomina et naturas ante nos et pauci et breviter attigerunt ex quibus Gyb. Longolius Germanus, et Gulielmus TURNER Anglus viri doctissimi præcipuam merentur laudem.”* Gesn. Præf. ad Avium Hist. TURNER also contributed to enrich GESNER's museum (the first collection of that kind,) with natural curiosities, which he sent from England. To which I add, that Dr. MERRET gives the following testimony to the worth of TURNER, in the Preface to his “ Pinax :” *“ Consului in quibusdam TURNERUM nostratem inter viros suæ ætatis exercitatissimum qui librum de avibus edidit mole parvum at judicio majorem.”*

Prefixed to the third volume of the *Frankfort* edition of GESNER's *Historia Animalium*, in 1620, we find a letter from Dr. TURNER, relating to the English fishes; which sufficiently proves, that he had no inconsiderable degree of knowledge in that part of zoology. He makes an apology for the imperfections of it, as being written from memory, and at a distance from all his notes and observations. It consists of three pages, in which he has briefly described more than fifty species; and it seems to be intended principally to give GESNER information on the English names, which TURNER has carefully noted, and often added the provincial appellations. He takes in both sea and river fish, and includes also the scallop and the cockle. This letter was written from *Weissenburgb*, and is dated Nov. 1, 1557. He undoubtedly pursued this branch of zoology much farther; since it appears from his dedication to the queen, that he intended "to set out a book of the names and natures of the fishes of her majesty's realms."

But the work which secured his reputation to posterity, and entitled him to the character

character of an original writer on that subject, in *England*, is his "History of Plants," printed at different times, in three parts, in folio, with cuts. The first at *London*, in 1551, under this title, "A NEW HERBALL, wherein are contayned the names of herbes in Greeke, Latin, English, Duch, Frenche, and in the Potecaries and Herbaries Latin, with the properties, degrees, and natural places of the same gathered. For Steven Mierdman." *Lond.* 1551. The second part at *Cologn*, 1562, during his exile in the reign of *Mary*. With this was reprinted the first part; and his "Book on the Bathes of *England* and *Germany*."

In 1568 these were reprinted, with the addition of the third part, which bears the following title: "The third part of W^m TURNER'S HERBAL, wherein are contained the herbes, rootes, and fruytes, whereof is no mention made of *Dioscorides*, *Galene*, *Plinye*, and other old authors. Imprinted at *Collen*, by Arnold Birckman, in the year of our Lord 1566." The dedication, however, to the company of surgeons, is dated from *Wells*, June 24, 1564.

Dr. TURNER'S "Herbal" is printed in the black letter, agreeably to the general usage of the times, and is embellished with the figures of most of the plants he describes.

The arrangement is alphabetical, according to the Latin names; and, after the description, he frequently specifies the places of growth. He is ample in his discrimination of the species, as his great object was, to ascertain the *Materia Medica* of the ancients, and of DIOSCORIDES in particular, throughout the vegetable kingdom. To this end he bestows much criticism on the commentaries of FUCHSIUS, TRAGUS, MATTHIOLUS, and other of his contemporaries; and professes to have corrected many of their mistakes, in the application of the names of DIOSCORIDES. In all this he has shewn much judgment, and, I may add, much moderation, in avoiding, more than usual, the licence taken by many of the commentators, of applying the names of plants described in THEOPHRASTUS, DIOSCORIDES, and PLINY, to those of the western parts of *Europe*. What he says of the virtues of
plants,

plants, he has drawn from the ancients ; but has, in numberless instances, given his opinion of their qualities, in opposition to those sages, and recorded his own experience of the virtues. He no where takes any doubtful plants upon trust, but appears to have examined them with all the precision usually exercised at a time when method, and principles now established, were unthought of ; every where comparing them with the descriptions of the antients and moderns. He first gave names to many English plants ; and, allowing for the time when specifical distinctions were not established, when almost all the small plants were disregarded, and the *Cryptogamia* almost wholly overlooked, the number he was acquainted with, is much beyond what could easily have been imagined, in an original writer on his subject,

The third part of his “ Herbal,” dated from *Welles*, June 24, 1564, he dedicates to the company of surgeons ; and apologizes for its imperfections : “ Being so much
“ vexed with sickness, and occupied with
“ preaching, and the study of divinity, and

“ exercise of discipline, I have had but
“ small leisure to write Herballles.”

In this part, he professes to treat on the plants not known to DIOSCORIDES and the antients. It consists of near an hundred articles, among which we find introduced many of the exotic subjects, which had before been but little known; such as *cassia fistula*, *cubebs*, *guaiacum*, *nutmegs*, *myrobalans*, *nux indica*, *nux vomica*, *anacardium*, *rhubarb*, *sarsaparilla*, *fenna*, and *tamarinds*. For these, many new figures were cut, which are executed in a stile superior to the others. The remainder are principally the productions of our own country.

The compleat edition of TURNER’S “Herbal,” in 1568, was printed at *Cologne*, unquestionably to receive the advantage of the figures, probably at that time the property of *Birkman* the printer. They are the same with which the octavo edition of FUCHSIUS was first printed in 1545; in all five hundred and twelve. Of these, TURNER has used upwards of four hundred; to which he has added about ninety new, making the whole number five hundred and two.

There

There are some instances of the wrong application of these figures; an error that might readily happen, when the author was at such a distance, and was common in almost all similar works of that time. There are also several figures to which no description of the plants can be found; for instance, the six figures of the *Geraniums* from FUCHSIUS occur, with a slight mention of only two species in the text.

TURNER is the first author who has given a figure of the Lucern; which, I apprehend, he first brought into *England*, and named *Horned Clover*. He treats largely of its cultivation, from PLINY, PALLADIUS, and COLUMELLA:

In the dedication to the first edition of his "Herbal," in 1551, Dr. TURNER speaks in very respectful terms of the botanical knowledge of several of his contemporaries; and apologizes for his undertaking so arduous a matter, while there were learned Englishmen better qualified. He enumerates Dr. CLEMENT, Dr. MERDY, Owen WOOTON, and Master FALCONER,

The last-mentioned is several times introduced in the body of the work. I can scarcely doubt that he was *John FALCONER*, who is recorded as having communicated many English plants to *AMATUS LUSITANUS*, who taught physic at *Ferrara* and *Ancona*, and made himself known as a commentator on *DIOSCORIDES* in 1553. In treating on the *Glaux*, of which *TURNER* gives a new figure, he says, "He never saw it in *England*, except in *Master Falconer's* book ; and that he brought it from *Italy*." From this and other like citations, it may reasonably be conjectured, that "*Falconer's* Book" was an *Hortus Siccus* ; and if so, must have been among the earliest collections of that kind, that is noticed in *England*.

In appreciating the merit of *Dr. TURNER* as a Botanist, due regard must be had to the time in which he lived ; the little assistance he could derive from his contemporaries, of whom, *BRUNSFELSIUS*, *RUELIUS*, *FUCHSIUS*, and *TRAGUS*, when he published his first part of the "*Herbal*," were the chief ; in which view, he will appear

pear to have exhibited uncommon diligence and great erudition, and fully to deserve the character of an original writer.

Our author paid early attention to mineral waters. He was probably the first who wrote on the baths of *Bath*, in *Somersetshire*. He visited several of the mineral springs in *Germany*, *Switzerland*, and *Italy*; and drew up, whilst abroad, a short account of ten of those waters; to which he prefixed a more enlarged history of the waters of *Bath*. This was written, as it should seem, at *Basil*, and is dedicated to his "well-beloved neighbours of *Bath*, *Bristow*, *Wells*, *Winsam*, and *Charde*," March 10, 1557. He adjudged the principle of Bath water to be brimstone, and possibly a little copper, from the vicinity of that metal in the neighbouring mountains. He says, he had been informed, that, besides brimstone, the King's bath held alum, and the Cross bath saltpetre; but that he could find neither. He concludes his account of the baths, by a set of general rules for all who drink mineral waters; many of which do him no discredit,

dit, when compared with the injunctions of modern physicians.

Our author also wrote "On the Nature of Wines commonly used in *England*," in vindication of the use of Rhenish wines. To this was annexed a tract "On the Nature and Vertue of Treacle." But, as I never saw these treatises, I can give no account of them.

Dr. TURNER was the author of many polemical and religious treatises, chiefly written in defence of the Reformation. Of these, a list is given in the *Athenæ Oxonienses*, and a more accurate and enlarged one in Bishop TANNER's *Bibliotheca*. Several of his tracts are yet in manuscript, in various libraries. He collated the translation of the Bible with Hebrew, Greek, and Latin copies, and corrected it in many places.

He procured to be printed at *Antwerp*, a new and corrected edition of the *Historia Gentis nostræ*, i. *Angliæ*, written by *William of Newburgh*, from a manuscript he found in the library of *Wells*; but complains, that the printer not only omitted to insert cer-
tain

tain articles sent by him, but left out the preface he sent him, substituting one of his own. Our author also translated several works from the Latin, particularly "The Comparison of the Old Learning and the New;" written by *Urbanus Regius*. Southwark. 1537. 8°; and again 1538 and 1548.

I will not conclude this short memoir of Dr. TURNER, without remarking, that the succeeding Herbalists, GERARD, JOHNSON, and PARKINSON, seem not to have paid due honour to his merit and learning, from the silence they observe relating to him in their writings. GERARD, indeed, mentions in his Preface, "that excellent work of master Dr. TURNER;" and, in another place, styles him "that excellent, painefull, and diligent phyfition, Mr. Dr. TURNER, of late memorie." In justice to TURNER, they should have noticed all the plants he has recorded, particularly the natives of *England*.

RAY, at the distance of near a century, was sensible of his worth, having styled him

him “ a man of solid erudition and judgment *.”

* In honour of TURNER, his name has been annexed, by *Plumier*, the French Botanist, to a new genus of plants, well known at this time in the English gardens. It was first discovered by SLOANE, in *Jamaica*, and described by him under the title of *Cistus Urticae folio*,

C H A P. 6.

Dr. Bulleyn—Anecdotes of his life—His Herbal; or Book on Simples—His Defence of the Fertility of England.

Dr. Thomas Penny: Short Anecdotes of—The friend and correspondent of Gesner, Clusius, and Camerarius.

Maplet—Morning.

B U L L E Y N.

CONTemporary with TURNER lived Dr. *William BULLEYN*. Although this writer does not come strictly within my plan; yet, as he lived at a period barren of interesting materials, and, as we learn from him several curious anecdotes respecting natural history and the state of gardening in England at that period, he cannot be passed over in silence.

Bishop TANNER briefly notices Dr. BULLEYN, and his writings; but his life is amply written in the *Biographia Britannica*, to which I must principally be indebted for my information,

He

He was born in the Isle of *Ely*, in the early part of *Henry* the Eighth's reign, and was educated at *Cambridge*, though, as *Wood* says, he afterwards resided some time at *Oxford*. It appears that he had travelled over several parts of *Germany*; that he visited *Scotland*, and had taken many tours in his native country; in all which, he studied the natural productions with a zeal and success not common in that age. In an early period of his life, he was much conversant about the city of *Norwich*. In June 1550, he was instituted to the rectory of *Blaxhall*, in *Suffolk*, where his relations resided. This preferment he resigned in 1554. Where he took the degree of doctor in physic, is not ascertained; but, from his prior attachment to physic, his known opposition to the doctrine of Transubstantiation, and the resignation of his living in the beginning of *Mary's* reign, it may be fairly conjectured, that he did not take his degrees in that faculty till after that period, and probably abroad. After this, we find him removed to the city of *Durham*, where he practised physic, and became possessed of property

property in the salt-pans, near *Tinmouth Castle*. On the death of his patron, Sir Thomas *Hilton*, he removed to *London*, where he became a member of the college of physicians, and acquired reputation as a physician, and a man of learning. This event took place about the year 1560. He had the misfortune to lose great part of his library, with his manuscript upon "Healthfull Medicines," by shipwreck; and after this disaster, met with most unjust and malevolent treatment, from a brother of Sir Thomas *Hilton*, by whom he was accused of having murdered his late patron, who died, in fact, of a malignant fever. And although his innocence was fully manifested, yet his enemy persisting further in his persecution, found means to throw him into prison, for debt, where he wrote a great part of his medical treatises. He died Jan. 7, 1576. He appears to have been much attached to the principles of the reformation. Bishop TANNER says he was a man of acute judgment and true piety.

I am not acquainted with any print of Dr. TURNER. Of Dr. BULLEYN there is
I a profile

a profile with a long beard, before his "Government of Health," and a whole length of him in wood prefixed to the "Bulwarke of Defence;" which book is a collection of most of his works. He was an ancestor of the late Dr. STUKELY, who, in 1722, was at the expence of having a small head of him engraved.

The part of his works, which has the nearest connection with my subject, is in his "Bulwark of Defence," in fol. 1562.

It is entitled, "A Book of Simples, being an HERBAL in the form of a dialogue, at the end of which are the cuts of some plants in wood." In this piece he observes, that *tormentil*, in pastures, prevents the rot in sheep; and adds, that the fact was confirmed by the shepherds in sundry parts of Norfolk. In his enumeration of the virtues of simples, from other authors, he does not fail to record his own experience on the power of several, in removing severe diseases. Of the effects of Dittander, *calamus aromaticus*, the Daisy, and others, he adduces particular instances. It were to be wished, that succeeding observations,

tions, had confirmed his representation. His travels, and the great attention he had paid to the native productions of his own country, had given him a comprehensive view of the natural fertility of the soil, and climate of *England*; which, from the tenour of his writings, seems to have been, at that time, by some people much depreciated. He opposes this idea with patriotic zeal and concern, and alleges various examples, to prove, that we had excellent apples, pears, plums, cherries, and hops, of our own growth, before the importation of these articles into *England* by the *London* and *Kentish* gardeners, but that the culture of them had been greatly neglected. He endeavours to confirm the natural fertility of the land, from the memorable instance of the *sea pease*, on the beach, near *Orford* and *Aldborough*; by an immense crop of which the poor were preserved in a time of dearth, in the year 1555. Of which see further accounts in *Johnson's GERARD*, p. 1250; *PARKINSON's* "*Theatre*," p. 1060; and *LOBEL's Illustrationes*, p. 164.

To conclude, Dr. Bulleyn's specific knowledge of Botany seems to have been but slender. His zeal for the promotion of the useful arts of gardening, the general culture of the land, and the commercial interests of the kingdom, deserved the highest praise, and for the information he has left of these affairs, in his own time, posterity owe him acknowledgments.

Although the progress of gardening does not enter into my plan, yet I am tempted, in this place, to remark, that, notwithstanding culinary herbs and roots, and many fruits, are said to have been imported in the reign of HENRY *the Eighth*, from *Holland* and *France*; and that the true æra of improvement in this art, cannot be carried, at the most remote time, beyond the same reign, yet it may justly be doubted, whether it was then in so low a state as hath been usually represented. With other arts, in its progression westwards, that of Horticulture must be supposed to have reached the *Low Countries* and *France*, before *England*; and a general, and prior superiority to our neighbours may be granted; and that a
fashion,

fashion, and a too great fondness for rarities of foreign growth, might influence the London market, of which the spirit of commerce would not fail to take advantage, must likewise be admitted. But, to the arguments and proofs alledged by *Dr. BULLEYN*, in defence of the fertility of his native soil, and the perfection of our own products; and, as a proof of the successful cultivation of those times, I add, that from an inspection of our old Herbals, and particularly of *PARKINSON'S Paradise*, we find the various species of culinary herbs, roots, and of fruits, multiplied in *England* to such a variety, as implies a preceding course of culture carried on for a series of time, inconsistent with that poverty of produce which hath been surmised.

P E N N Y.

Having introduced to the reader, the two first respectable writers on Botany in *England*, I cannot but regret my want of sufficient information, to rescue from an almost total obscurity, the name of *Dr.*

Thomas PENNY, an Englishman of the same age; who, although not an author himself, was indubitably a man of great attainments in the natural history, and especially in the Botany, of his time. GERARD styles him "A second *Dioscorides*, for his singular "knowledge in plants." I cannot ascertain the date of his birth. It appears that he was a fellow of the royal college of physicians, and that he had travelled into various parts of *Europe*. He had resided in *Switzerland*, and had visited, if not made some stay in, the island of *Majorca*. That he had diligently searched both the northern and southern parts of *England* is manifest, from the variety of rare plants discovered by him, and communicated to LOBEL and GERARD. He was personally known to GESNER and CAMERARIUS, and afterwards frequently supplied them with rare plants, for their respective *Herbaria* and gardens.

During his residence in *Switzerland*, he collected many plants of that country, and from the confines of *France*. He assisted GESNER, as appears by his observations
and

and animadversions on that author's tables, published by SCHMIEDEL from the collections of TREW, in 1753, in which the most honourable testimony is given to his abilities. I suspect he was in *Switzerland*, at the time of GESNER's death, and assisted WOLF in arranging the plants, and memorials of their deceased friend.

There can be no doubt that PENNY and CLUSIUS were also personally acquainted. They appear to have had a strict intimacy, and the latter was obliged to PENNY for a variety of curious articles inserted in his *Rariores*, and in the *Exoticæ*. Dr. PENNY brought from *Majorca* the *hypericum balearicum*, which CLUSIUS named *myrtocistus PENNÆI* after him, as he did a gentian, now the *swertia perennis*. The same of the *geranium tuberosum*. The *cornus berbacea*, that beautiful native of the *Cheviot* hills, was first revealed to the curious by this industrious naturalist.

Dr. PENNY's acquirements in natural history extended beyond the knowledge of plants. He is one of the first Englishmen whom I have met with, who had studied

insects. There are letters written by him to CAMERARIUS, in the year 1585, preserved in TREW's collections, which prove his knowledge in *entomology*, to have been extensive in that day: and it is supposed by SCHMIEDEL, that GESNER's drawings of *Papilio*'s, passed into the hands of PENNY. This supposition is rendered more probable, when it is recollected, that the *Theatrum Insectorum* of MOUFET, was a work begun by Dr. Edward WOOTON, Conrad GESNER, and Dr. PENNY, and received only the finishing hand from MOUFET.

Dr. PENNY died in 1589, and is said by JUNGEMAN to have left his papers to MOUFET and TURNER; but, in this account there is surely a very striking anachronism, since TURNER himself died in the year 1568.

MAPLET.

John MAPLET, master of arts, of Cambridge, published in the year 1567, "A GREEN FOREST; or, Natural History; wherein may be seen, the sovereign
" reign

“raign vertues of all kinds of stones, and
“metals, *herbs, trees, beasts, foulds, and*
“fishes; 112 leaves, 8°.” I have not seen
Maplet’s book; but from the title of another
work of his, “*The Dial of Destinie;*
“or, Influence of the Seven Planets over
“all Kinds of Creatures here below,” published
in 1581, it may fairly be presumed, that he
was deep in the fancies of the astrologic sect.

M O R N I N G.

Between the publication of *TURNER’S* Herbal, and that of *LYTE*, I find a book, of which, not having seen it, or been able to refer to any account, I can only recite the title. “*The Treasure of Euonymus by*
“*Peter MÖRNING;* with wooden cuts.
“Imprinted by John Day.” 4°, 1575.

C H A P. 7.

Lyte—Anecdotes of—Not an original writer in Botany—His Herbal a translation from Clusius's version of Dodoens—Small accession made to English Botany by this work.

L Y T E.

HENRY LYTE, Esq; of an ancient family, at *Lytes-Carey*, in *Somersetshire*, was the next after **TURNER** who published an *English Herbal*. He was born in 1529, and became a student at *Oxford* in the latter end of *Henry VIII.* about the year 1546. He afterwards travelled; and at length retired to his patrimony, where, as *Wood* says, “ by the advantage of a good foundation
“ of literature made in the university and
“ abroad, he became a most excellent scholar in several sorts of learning.” He was the author of various publications of the historical kind, which are enumerated in the *Athenæ Oxonienses*. He died at the age of 78,
and

and was buried at *Charlton-Mackerel*, in the same county. He left a son, who drew up a genealogy of *James I.* for which the king rewarded him with his picture in gold, set with diamonds; and the prince, afterwards *Charles I.* gave him also his picture in gold.

Although Mr. LYTE does not rank among original writers in Botany, his work nevertheless seems to have been well received. Even the arrangement alone would instantly give it a great advantage over *Turner's* book. It is professedly a translation from the French version of the Dutch Herbal of DODOENS, written by the author in 1553, and translated by *Clusius* in 1557; being the first of his publications. Of DODOENS, it will be necessary to give some account; but I shall defer it till I speak of GERARD, as the improved editions of DODOENS's book were the basis of that author's work.

The first edition of LYTE's Herbal was published at *Antwerp*. It is printed in the black letter, and bears the following title:

“ A NIEWE HERBALL, OR HISTORIE OF
“ PLANTES,

" PLANTES, wherein is contain'd the whole
 " discourse and perfect description of all sorts
 " of herbs and plantes ; their divers and fun-
 " dry kindes ; their straunge figures, fashions,
 " and shapes ; their names, natures, and ope-
 " rations and vertues : and that not only of
 " those which are here growyng in this our
 " countrie of Englande, but of all others also
 " of forayne realmes, commonly used in phy-
 " sicke. First set forth in the Doutche or
 " Almaigne tongue, by that learned D. *Rem-
 " bert DODOENS*, physition to the emperor ;
 " and now first translated by

" *Henry LYTE*, *Esquyer*.

" At London, by me, *Gerard Dewes*. 1578."
 —The Colophon, "imprinted at *Antwerpe*,
 " by me, *Henry Loe*, book-printer." pp.
 779.

Mr. LYTE dedicates his work to queen
Elizabeth; and has prefixed the preface and
 appendix in Latin, from DODOENS, or
 DODONÆUS. The latter of these is a col-
 lection from DIOSCORIDES and CATO, but
 chiefly from PLINY, relating to the rise
 and progress of botanical and agricultural
 knowledge

knowledge among the Romans; and in commendation of gardens, with-rules for laying them out, and managing them to advantage.

He has followed his original in dividing his subjects into six books; and, although the general arrangement is confused, **LYTE** has the merit of having introduced a particular order in each chapter, or genus, much superior to that of **TURNER**; having divided the species, description, place, time, names, nature, and virtues, under these several titles, into distinct sections. This arrangement was adopted by **GERARD** and **PARKINSON**.

LYTE describes one thousand and fifty species, of which eight hundred and seventy are figured. The blocks are, I believe, the same with which **CLUSIUS**'s own translation was printed; being, as far as those extend, copies from the octavo edition of **FUCHSIUS**. Most of **TURNER**'s figures are found in **LYTE**. The remainder are such as had been cut for the subsequent works of **DODOENS**, and afterwards embellished the *Pemptades* of that author, and **GERARD**'s history.

history. The English translator added about thirty new ones. Among these, several are in a style superior to those of CLUSIUS and GERARD; such are particularly, the *Salvia Æthiops*; the *Stratiotes aloides*; the *Rba*, or *Centaurea Rbaponticum*; and others.

Some are original: I cite only the *Erica Tetralix*, of which I find no figure prior to *Lyte's*; that of GERARD (or, which is the same, of *Clusius*) applied to it by JOHNSON, being certainly intended to represent another species, and is accordingly referred to the *Mediterranea* by LINNÆUS.

The first edition of *Lyte* is adorned with a finely-cut impression in wood of DODDENS, in the thirty-fifth year of his age; and a large engraving of Mr. *Lyte's* coat of arms.

This first edition was undoubtedly printed at *Antwerp*, to receive the advantage of the figures. The subsequent editions, therefore, afterwards printed in *England*, are without figures. It was reprinted, as *Ames* informs us, in 1586, and in 1595; and, according to *Wood*, by *Ninon Newton*, at *London*, in 1589, in quarto also, without cuts.

cuts. I find editions mentioned, with the dates 1600 and 1619, which, if genuine, and not in the title-page only, is a proof of its popularity; and that it was not superseded by the larger work of GERARD in 1597. SEGUIER even quotes one, so late as the year 1678.

As in the interval between the publication of CLUSIUS's French translation in 1557, and the English version of it by LYTE in 1578, the author had at different times compleated the several parts of his *Historiæ Plantarum*, it may be presumed, that LYTE profited by those works. From some of the commendatory verses prefixed, it should seem, that *Dodoens* himself communicated additions to LYTE. As I have not had an opportunity of comparing the French version of *Clusius* with LYTE, I cannot notice the nature of his alterations, or the extent of his additions. The introduction of the English names was a necessary augmentation.

In the mean time, there seems to be no ground for the criticism of THRELKELD; who accuses LYTE of having omitted the

Purgantium

Purgantium Historia of DODONÆUS, of which LYTE appears unquestionably to have introduced the most material subjects.

English Botany, however, received little or no accession from LYTE himself. It is not in more than about twenty instances, that he has even pointed out the local situation of any rare English plants; and, in these instances, there is scarcely one, which had not been thus *specifically* recorded by TURNER and LOBEL, before him.

Hence, I am not able to give LYTE the credit, although he lived at so early a period, of being the first discoverer of a single species of rare growth. Yet, as it is but justice to suppose him well acquainted with all the common plants, so a large number of these, which had been unnoticed by TURNER, or are not easily ascertained in his work, will be found first announced to the English Botanist in LYTE. I confess, however, that it is extremely difficult to determine, in a variety of instances, whether the general places of growth, as mentioned in this author, are inserted from his own knowledge, or whether they stand as

translated by him from CLUSIUS. It is this doubt that has induced me, not unfrequently, to ascribe to GERARD, or JOHNSON, the first knowledge of many common plants certainly ascertained by them, that occur, nevertheless, in LYTE's work.

This author furnishes very few observations which tend to illustrate the state of the science, between the time of TURNER and his own. Nor does he mention, in more than one or two instances, any of his contemporaries. Under the article *Verbascum*, he speaks of "the pleasant garden of James Champaigne, the deer friende and lover of plantes:" but without any information of his character, or place of abode. And, under that of *Sweet Trefoil*, "the garden of maister Rich."

C H A P. 8.

Lobel—*Anecdotes of*—Of Flemish extraction, but lived chiefly in England—Travelled with Lord Zouch—Entitled Botanist to King James—The Adversaria, written jointly by him and Pena—Lobel a learned man, and well versed in the Materia Medica — English Botany greatly augmented by him—Promoters of Botany and gardening mentioned by him.

Newton—His Herbal to the Bible—only a translation from Lemnius.

L O B E L.

MATTHIAS de LOBEL, though not a native of Britain, contributed so largely to the emolument of English Botany, that he justly claims attention in the object of this work. LOBEL was of Flemish extraction, and was born in 1538 at Lisse, where his father was in the profession of the law.

He informs us, that, at the age of sixteen, he was enamoured with the love of plants ;

plants ; and had an unconquerable desire to know the names and properties of those used in physic. He studied at *Montpelier*, under the famous RONDELETIUS. During his residence there, he travelled over the south of *France* in search of simples.

At *Narbone* he formed a connection with *Peter PENA*, who was jointly concerned with him in his first work the *Adversaria*. On leaving *France*, he extended his researches by travelling over *Switzerland*, the county of *Tyrol*, some parts of *Germany*, and *Italy* ; and on his return settled as a physician at *Antwerp*, and afterwards at *Delft*. He was then made physician to *William Prince of Orange*, and to the States of *Holland*. On what occasion he removed into *England*, or at what period of his life, I cannot ascertain. From the circumstance however of the *Adversaria* bearing date at *London* in 1570, it should seem to have been before that time, which opinion is somewhat corroborated, by his informing us, that *Dr. TURNER* had given him, “ long before,” the seeds of the *sea kale*.

In *England*, he obtained the patronage of

Lord Zouch, whom he attended in 1592, in his embassy to the court of *Denmark*. This tour furnished him with further means of augmenting his knowledge in Botany; and, through the correspondence he formed there, of introducing into *England* several exotic rarities, before that time unknown to this country. He had the superintendence of a garden at *Hackney*, which he calls a physic-garden, cultivated at the expence of his patron. He was afterwards styled Botanist to King *James*, as appears by the *imprimatur* to the second edition of the *Adversaria*; and by his own letter prefixed to GERARD'S "Herbal." Whether any emolument was annexed to this title, I am unable to decide. He had a daughter married to a Mr. *James COEL*, who lived at *Highbate*, near *London*; and it is probable, from the very frequent mention that LOBEL makes of that place in his last work, the *Illustrationes*, that he resided in the latter years of his life with his son-in-law.

He died in 1616, aged 78. There was a print of LOBEL, but it is very scarce, I have

only seen it in the collection of the late Mr. *Gulston*.

The first of LOBEL's publications, and which more eminently agrees with the design of this work, as it brought a large accession to English Botany, was the *Stirpium Adversaria*. The professed intention of this work was to investigate the Botany and *materia medica* of the antients, and particularly of DIOSCORIDES; and LOBEL is judged to have corrected the errors of MATTHIOLUS, upon that author, in many instances.

As PENA was jointly concerned with LOBEL in this work, it is become impossible, at this time, to assign to each their separate share. The first edition of the *Adversaria*, dated at *London* 1570, was dedicated to the queen. This dedication was omitted in an edition printed at *Antwerp* in 1576. Editions bearing date 1571, 1572, are recorded, but it may be doubted whether these were more than title-page alterations. To that of the whole *Adversaria*, which bears date *London* 1605, by *Purfoot* also, is prefixed LOBEL's *Animad-*

versiones in Rondeletii methodicam Pharmaceuticam officinam; containing 156 pages. After this, the title, and a dedication to the professors at *Montpelier*, printed by *Purfoot*; but the succeeding first part of the *Adversaria*, is on a much better paper, and in a finer type, and evidently printed by *Plantin* as far as to page 450; to which succeeds one leaf, added in *Purfoot*'s type, containing the account of the *Plocamos* of *Portland*, and of the *Barnacle*, the fabulous history of which he relates, without wholly denying it. Then follows, (the pages being continued,) the second part of the *Adversaria*, now first printed by the *London* printer. To which is annexed, *LOBEL*'s "Tract on the Balfams, Cinnamon, Cassia," and various other matters; with a small treatise on the dropsy, and the *elephantiasis*, written by his much revered master *RONDELETIUS*.

The second edition bears the following title, "*Dilucidæ Simplicium Medicamentorum explicationes, et STIRPIUM ADVERSARIA, perfacilis vestigatio, luculentaque accessio ad prisorum, præsertim Dioscoridis et recentiorum*
Materiæ"

Materiae Medicæ solidam cognitionem. Methodo exquisitissima, a notioribus summisque classum generibus ad ultimas usque species digesta. Authoribus Petro PENA, et Matthia de LOBEL medicis. Quibus accessit ALTERA PARS, cum prioris illustrationibus, castigationibus, auctariis, rarioribus Plantis. Selectioribus remediis, succis medicatis et metallicis, medicinæ thesauris, opii opiiati antidoti, decantatissimique chymistarum et germanorum laudani opiiati formulis. Opera et Studio Matthiæ de Lobel, Londini 1605. pp. 549.

Accessit Matthiæ de Lobel, in Rondeletii Methodicam Pharmaceuticam animadversiones cum Myrei paragraphis. pp. 156."

Reprinted at Frankfort in 1651.

In the execution of this work, there is exhibited, I believe, the first sketch, rude as it is, of a natural method of arrangement; which, however, extends no farther than throwing the plants into large tribes, families, or orders, according to the external appearance, or habit of the whole plant or flower; without establishing any definitions or characters. The whole forms forty-four tribes. Some con-

tain the plants of one, or two modern *genera*: others many; and some, it must be confessed, very incongruous to each other. On the whole, they are much superior to DODOENS's divisions; and sufficiently testify, that the author was sensible of the want of a better arrangement than the mere alphabetic order, or that formed from the supposed qualities, and uses in medicine.

At the head of each tribe, or family, he prefixes a synoptical view of all the species to be described under it. His method, then, is to give the *Greek* and *Latin* name; and, wherever he can, the name of the genus and species, in *German*, *Dutch*, *French*, and *English*. Then the description of the plant, the time of flowering, the country in which it grows spontaneously; and, in *England*, he points out the particular spot, where some of the more rare are found: Mr. RAY, however, has remarked, that in this respect LOBEL has been inaccurate, or trusted too much to his memory; since many have been sought for in vain, in the situations he specified. Frequent reference is made in the margin to the figures in

FUCHSIUS,

FUCHSIUS, MATTHIOLUS, DODONÆUS, as far as p. 200 ; after which, this assistance is wanting. LOBEL's own figures are small, and insufficient in many cases to express the habit of the plant, the delineation of which, was almost the extent of the efforts of those days.

LOBEL having carefully studied the antients, on the *Materia Medica* ; having travelled much, and seen plants in various countries, was enabled to exercise critical skill, and to detect numerous errors in the dispensation of simples, which he does not fail to point out. His strong attachment to the study interested him powerfully in the investigation of new plants, and enabled him to make large accessions to knowledge. He travelled over various parts of *England*, and discovered many vegetables before unnoticed. He added to the *grasses* a number of new species ; and, although his stile is universally condemned as harsh and incorrect, and his descriptions frequently obscure and insufficient, the *Adversaria* has, on the whole, great merit, abounding with much curious intelligence, and some new discoveries.

The second part of the *Adversaria* is but a small part of the whole. It presents us with a list of one hundred and thirty species of grasses, known to the author: this is followed by the figures and descriptions of some new and rare kinds, of the same tribe. A number of new plants of the liliaceous and bulbous-rooted order; a copious account, with a figure, of the *yucca*, lately introduced; concluding with a catalogue from CLUSIUS, of thirty-eight varieties of *Anemone*—a proof of the flourishing state of the Florist's art, in the beginning of the last century; at which time it is certain, from LOBEL's book, that many people were very assiduous in the cultivation of exotics.

In 1576, LOBEL published a book, well known, and much quoted since, by the name of "OBSERVATIONES; *five Stirpium Historiæ, cui annexum est Adversariorum Volumen. In fol. cum Iconibus.*"

By the assistance of *Plantin*, this volume was accompanied with 1486 figures, which had been cut for the works of CLUSIUS, MATTHIOLUS, and DODONÆUS.

In 1581 it was translated into Dutch, to-

gether with the *Adversaria*, and the figures augmented to the number of 2116. The same year the *icons* were separately cast off, on paper of the oblong form; the figures amounting to 2191. Some of these impressions were accompanied with an index, in seven languages, which rendered it a very popular book for many years. It preserves some value to this day, as being the edition that LINNÆUS quotes throughout his works.

LOBEL had meditated a very large work, which was to have borne the title of "ILLUSTRATIONES PLANTARUM;" but he lived not to finish it. Some of his papers fell into the hands of PARKINSON, and were incorporated into his *Theatrum*. A fragment of the above-mentioned work was published by Dr. How, in 1655; which contains the descriptions of many grasses, and other plants newly discovered, or lately introduced. Of the grasses, many here recorded were first discovered by LOBEL. The preface contains some severe censures on GERARD, and reflexions on the treatment LOBEL had received from booksellers; all
written

written in a stile very reprehensible in a man of letters. He may be justly accused of uncandid and disingenuous conduct towards GERARD, whom, while living, he had treated with the appearance of friendship and esteem, and of whose abilities, and zeal, he had spoken in the highest terms; as is manifest in various parts of the *Adversaria*, in the attestation to the catalogue of GERARD'S Garden, and by the commendatory letter prefixed to his Herbal.

I regret that I am not able to do more than barely enumerate the following persons, who were zealous promoters of gardening, and botanical knowledge, in the time of LOBEL, and liberal in their communications to him.

Dr. *James* CARGIL, of *Aberdeen*; of whom, however, some brief mention will be made hereafter.

Edward SAINT LOO, Esq; of *Somersetshire*, whom he speaks of as much attached to studies of this kind.

James COEL, of Highgate, son-in-law to LOBEL,

J. NAS-

J. NASMYTH, surgeon to James the First.

John De FRANQUEVILLE, a merchant in London; a celebrated florist, and a great lover of all rare plants, as well as flowers; from whose care, as Parkinson says, "is sprung the greatest store that is now flourishing in this kingdom."

Hugh MORGAN, apothecary to queen *Elizabeth*; of whose garden very frequent mention occurs, in both parts of the *Adversaria*; and also in GERARD'S History afterwards, who styles him "a curious conservator of simples."

William COYS, of *Stubbers*, in the parish of *North Okington*, in *Essex*, possessed a garden, which both LOBEL* and GERARD inform us, was richly stored with exotics. Under his care, the *yucca* first flowered in *England*, in the year 1604.

To

* The name of LOBEL was perpetuated by PLUMIER, who gave it to a plant, which is a native of both the Indies, since denominated *Scævola*. But the Swede has preserved the name to a numerous set of plants of the syngeneisous class, among which rank the cardinal flowers, and two English species,

PLUMIER

To these must be added the well-known names of GERARD and PARKINSON.

NEWTON.

There is "an Herbal to the Bible," said to be written by *Thomas* NEWTON, and printed in 1587. 8°. This author, after having practised physic, became a divine and schoolmaster, at *Ilford*, in *Essex*; where he died in 1607. His book, I believe, is only a translation of "LEVINI LEMNII *Explicatio Similitudinum quæ in Bibliis ex herbis et arboribus sumuntur.*" LEMNIUS, who was a physician in the province of *Zealand*, briefly describes the plants of the holy Scriptures, and produces a number of curious philological observations respecting the uses of plants in ceremonial and sacred rites. He also wrote a memorable work, *De Miraculis occultis Naturæ*. The singular pro-

PLUMIER also commemorated PENA, by giving his name to one of his new American plants; which, as it proved to be a species of *Polygala*, was transferred by the author of the sexual system, to an Ethiopian plant of the tetrandrous class, though allied in habit to the *Ericæ* and *Passerinaæ*.

perty

perty of madder in colouring red the bones of animals that are fed with it, appears to have been known to *Lemnius*; but whether he learnt it from *Mizaldus*, or the latter from him, I know not. His book was among the earliest productions in its way, and seems to have been well received, as may be judged by its passing through twelve or thirteen editions, from its first publication in 1563 to 1627.

I conceive this *Thomas* NEWTON to have been the writer of those commendatory lines prefixed to *LYTE's Herbal*; in which, after complimenting the author for his judicious selection of useful knowledge from former writers, he has *versified*, in less than two pages, the names of more than two hundred worthies in medical science, from the earliest antiquity to his own times.

C H A P. 9.

Account of Dodoens, and his Pemptades, as introductory to the Herbal of Gerard—Circumstances of the times favourable to Gerard.

Account of Gerard—The catalogue of his garden—

Account of his Herbal; a popular work for more than a century—Contemporary Botanists : Hesketh—Garet : the correspondent of Clusius—Lete, and others.

G E R A R D.

LOBEL's writings, howsoever esteemed by the learned, having never been translated into English, could not become popular; and, at the conclusion of the sixteenth century, TURNER's book was, probably no less obsolete, than LYTE's was imperfect. These circumstances, conspiring with the growing taste of the times for gardening, it may be presumed, incited GERARD to undertake his Herbal: a work which maintained its credit and esteem for more than a century; and, pleasing as it is to reflect on the rapid progress and improvement of Botany, within the last half century, yet there are many now living who

can

can recollect, that when they were young in science, there was no better source of Botanical intelligence, in the *English* tongue, than the Herbals of GERARD and PARKINSON.

It has been observed, that the early edition of DODOENS's book, as translated by CLUSIUS, had been the basis of LYTE's Herbal; and, as the last edition of the same author became the foundation of GERARD's, this circumstance renders it not unsuitable here to take some notice of an author, although a foreigner, to whom he owed so much of that credit, which has preserved his memory to the present times.

Rembert DODOENS, or *DODONÆUS*, was born in 1517, near *Mechlin* in *Flanders*. He became conspicuous for his various erudition when young; was physician for some time to the Emperor *Maximilian*, and his son *Rodolph* II. The importunity of his friends procured his dismissal from the Emperor's service, and he settled at *Antwerp*; was afterwards professor at *Leyden*; and died in 1586. He wrote on astronomy, geography, and physic; but is remembered
now,

now, principally, by his botanical works. His attachment to this study, and the opportunities he enjoyed of gratifying it, enabled him to turn it to the most advantageous purposes. He began to publish in 1552, and continued his accessions and improvements to the year 1583, when he collected all his writings, on this subject, into one volume, under the following title, "*STIRPIUM HISTORIÆ PEMPTADES Sex, five Libri XXX. Ant. ex officin. Plant.*" in folio. cum icon. 1341. pp. 872. Each Pemptade is divided into five books:

The 1st comprehends a number of dissimilar plants in alphabetic order.

2. Flower-garden plants; and the umbelliferous tribe.

3. Medicinal roots: purgative plants: climbing and poisonous plants: ferns, mosses, and fungi.

4. Grain: pulse: grasses: water and marsh plants.

5. Edible plants: gourd plants: esculent roots: oleraceous: thistles and spinose plants.

6. Shrubs and trees.

It was reprinted in 1612 and 1616, with some

Some small additions, and being translated also into Dutch, with great enlargement, became a popular book in that language.

The judicious selection of all that was useful, relating to the supposed plants of the *Materia Medica* of DIOSCORIDES, and of the Arabians, the introduction of all the new species from CLUSIUS, and other discoveries of the time, added to the instruction and embellishment derived from the figures, which exceeded in number those of any preceding author, rendered *Dodoens's* book useful to the medical profession throughout the world. It still preserves some value, as being referred to by LINNÆUS, for the illustration of the European plants.

As GERARD could not attempt an entire new work, there was then extant no other to which he could give the preference, as a basis to his design; for as such only it must be considered, since the interval of time between the publication of DODONÆUS's work in 1583, and the printing of his own "Herbal," had given him opportunities to intersperse large additions, both in exotic, and indigenous Botany. In this in-

terval the science had been augmented, and not less enriched, by the writings of CÆSALPINUS, in 1583; by the *Epitome* of CAMERARIUS, in 1586; by the *Historia Lugdunensis* of DALECHAMP, in 1587; by the *Sylva Hircynia* of THALIUS; and especially by the *Historia* and *Icones* of TABERNÆMONTANUS, in 1588 and 1590.

To these may be added, a number of collateral resources, which the growing commerce and spirit of the times rendered favourable to his purposes. I will briefly mention the following: the *Materia Medica* had, for a series of years, been perpetually augmenting, by a variety of new drugs, which were eagerly sought after, the origin of which, notwithstanding, was in many instances obscure, and in others as yet unknown. At length the publication of GARCIA ab HORTO on the simples of the East Indies, of MONARDES on those of the West, and afterwards of *Christopher à COSTA's* book, satisfied, for a time, the impatience of the public.

These authors were translated into English. *James FRAMPTON*, a merchant of
London,

London, who had resided long at *Seville*, from whence he returned in 1576, translated MONARDES into English the next year, under the title of "Joyful News out of the New Founde World, from the Spanish of *Monardus*," in 4°. CLUSIUS put GARCIA *ab HORTO* into Latin, in 1567; and James GARET had also translated from the Spanish the work of à COSTA. These books were incentives to curiosity; and the thousand novelties which were brought into *England* by our circumnavigators, RALEIGH and CAVENDISH, in 1580 and 1588, excited a degree of attention, which at this day cannot, without the aid of considerable recollection, be easily conceived. RALEIGH himself appears to have possessed a larger share of taste for the curious productions of nature, than was common to the seafaring adventurers of that period. And posterity will rank these voyagers among the greatest benefactors to this kingdom, in having been the means, if tradition may be credited, of introducing the most useful root that Providence has held forth for the service of man. A voyage round the globe, how-

soever familiarized in ours, was in that age a most interesting and fruitful occasion of enquiry.

The return of RALEIGH, and the fame of his manifold discoveries and collections, brought over from the continent the celebrated CLUSIUS, then in the 55th year of his age. He, who added more to the stock of Botany in his day, than all his contemporaries united, visited ENGLAND, for the third time, to partake, at this critical juncture, in the general gratification.

At this eventful period, GERARD was in the vigour of life, and without doubt felt the influence, and reaped the advantage of all the circumstances I have enumerated.

John GERARD was born at *Nantwich*, in *Cheshire*, in the year 1545, and was educated a surgeon. He removed to *London*, where he obtained the patronage of the great *Lord Burleigh*, who was himself a lover of plants, and had the best collection in his garden of any nobleman in the kingdom. GERARD had the superintendence of this fine garden, and retained his employment, as he tells us himself, for twenty years.

years. He lived in *Holborn*, where also he had a large *physic* garden of his own; which was probably the first of the kind in *England*, for the number and variety of its productions. It should seem, that in his younger days he had taken a voyage into the Baltic, since he mentions having seen the wild pines growing about *Narva*.

GERARD appears also to have been favoured by the college of physicians, and is highly extolled by Dr. BULLEYN. Both LOBEL, and Dr. BROWNE, physician to the queen, wrote, in Latin, commendatory letters to him, on the publication of his *Herbal*. He attained to such eminence in his profession, as to be chosen master of the company. He died about the year 1607.

There is a half sheet print of GERARD prefixed to his own edition of the "*Herbal*," done in the 53d year of his age, and a small oval one at the bottom of a full half sheet frontispiece, before JOHNSON'S edition.

The earliest publication of GERARD was the list of his own garden in *Holborn*,

under the following title, “ *Catalogus Arborum, Fruticum, ac Plantarum, tam indigenarum quam exoticarum, in horto JOHANNIS GERARDI, civis ac chirurgi Londinensis nascentium*. Impensis J. Norton, 1596.” 4°, and again in 1599.

The first edition was dedicated to Lord BURLEIGH; but that nobleman dying before the publication of the second, it was inscribed to his patron, *Sir Walter RALEIGH*.

This little piece, from the nature of the publication, is become very scarce. I believe there is only a manuscript copy of it in the collection of *Sir JOSEPH BANKS*.

We are informed, in the life of Dr. BULLEYN, that GERARD'S Garden contained near eleven hundred sorts of plants, of foreign and domestic growth; from whence, says Mr. *Oldys*, “ it may appear, that our ground would produce other fruits besides hips and haws, acorns and pignuts;” for at this time, “ kitchen-garden wares were imported from Holland, and fruits from France.” There are one thousand
and

and thirty-three species in this Catalogue, and the following attestation, written by LOBEL, is annexed.

“ *Herbas, stirpes, frutices, suffrutices, et arbusculas hoc catalogo recensitas, quamplurimas ac fere omnes me vidisse Londini in horto Johanni GERARDI, chirurgi et botanici peroptimi (non enim omnes eodem sed variis temporibus anni pullulascunt, enascuntur et florent). Attestor Matthias De LOBELL, ipse calendis Junii 1596.*”

In 1597, came out his “HERBAL, or GENERAL HISTORY OF PLANTS;” printed by John Norton, in folio; and some authors mention another impression in 1599.

That the foundation of this work was a translation of DODOENS’s Herbal, a comparison of the two ascertains beyond a doubt. LOBEL, both in his animadversions on RONDELETIUS, and in his *Stirpium Illustrationes*, informs us, that Dr. PRIEST, at the expence of Mr. Norton, had been engaged to make a translation of DODONÆUS’s *Pemptades*; and, dying soon after he had finished it, the manuscript came into GERARD’s

hands; who has been censured for having endeavoured to conceal his possessing these papers, and for assuming to himself the merit of the translation, when it is generally agreed, that his knowledge of the Latin language was not equal to such an undertaking. LOBEL, indeed, judged the same of Dr. PRIEST, and points out instances of his insufficiency. It must, however, be allowed, that GERARD is not backward in confessing his want of skill in the learned languages. LOBEL farther informs us, that when the work was in the press, and that part of the first book printed relating to grasses, his friend, *James GARET*, a person eminently skilled in flowers and exotics, admonished *Norton* of some gross errors; on which, the printer engaged LOBEL to superintend the work; that he actually did correct it "in a thousand places;" and that there were many other mistakes, which GERARD would not allow him to alter, alleging that it was sufficiently correct, and that "LOBEL had forgotten the English language."

In order further to conceal his plagiarism,

LOBEL

LOBEL adds, that he has inverted the distribution of the chapters in DODOENS's book, and adopted that of the *Adversaria*. This may be considered as a futile objection, and even turned into an approbation of LOBEL's method; but he charges him also with largely plundering the *Adversaria*, without any acknowledgment.

GERARD comprises the whole vegetable kingdom in three books. The *first* contains the grasses, grain, rushes, reeds, flags, and bulbous-rooted plants. The *second*, all herbs used in diet, physic, or for ornament and pleasure. The *third*, trees, shrubs, fruit-bearing plants, resins, gums, roses, heaths, mosses, mushrooms, and sea plants. The whole divided into upwards of eight hundred chapters, which, in the arrangement of that time, may, if the expression is allowable, be considered as so many genera.

In each chapter the several species are described; then follow the place, time of flowering, names, and virtues.

The figures Mr. Norton procured from *Frankfort*, being the same blocks which had been used for the Dutch Herbal of TABER-

NÆMONTANUS in 1588. In this manner, GERARD, with DODOENS for his foundation, by taking in also many plants from CLUSIUS, and from LOBEL, by the addition of some from his own stock, published a volume, which, from its being well timed, from its comprehending almost the whole of the subjects then known, by being written in English, and ornamented with a more numerous set of figures than had ever accompanied any work of the kind in this kingdom, obtained great repute. To this we must add the fortunate circumstance of its acquiring afterwards so learned an editor as JOHNSON, which established the character of it, and gave it precedence as a popular book, for more than a century. And notwithstanding his manifest inferiority to LOBEL in point of learning, it must yet be owned, that GERARD contributed greatly to bring forward the knowledge of plants in *England*. His connection with the great, and his situation in *London*, favoured an extensive correspondence, both with foreigners and his own countrymen; and his success in procuring new exotics, as well as scarce
indigenous

Indigenous plants, was equal to his diligence and assiduity. In fact, we owe to GERARD and his friends the discovery of many new English plants; and his name will be remembered by botanists with esteem, when the utility of his Herbal is superseded. That he was considered as possessing a very extensive share of this science, we are justified in believing, on the testimony of Mr. George BAKER, chief surgeon to the queen, who assures us, that he saw him “tried with one of the best strangers that “ever came into *England*, and was accounted in *Paris* the only man, being “recommended to me,” says BAKER, “by “that famous man, AMBROSE PAREY; “and he being here, was desirous to go “abroad with some of our herbarists, for “the which I was the mean to bring them “together, and one whole day we spent “therein, searching the rarest simples: but “when it came to the trial, my French- “man did not know one to his four*.”

* PLUMIER gave the name GERARDIA to a plant of the *didynamous* class, discovered in the tropical regions of America; to which LINNÆUS has since added five species.

Among

Among the many who promoted GERARD's work by their communications, I must not omit the names of *Thomas HESKETH*, of *Lancashire*; *Thomas EDWARDS*, apothecary, at *Exeter*; both skilled in the knowledge of English plants.

James GARET, of *London*, apothecary, "a curious searcher of simples." He was the correspondent of *CLUSIUS*, to whom he communicated a great number of natural curiosities, particularly of exotic growth, and is mentioned with great respect by that learned foreigner, in numerous places of his *Libri Exoticorum*. He seems to have been one of the principal cultivators of tulips, which he propagated by seeds and bulbs for twenty years, every season bringing forth, as GERARD observes, "new plants of sundry colours not before seen, all which to describe particularly, were to roll *Sisypus's* stone, or number the sands."

I find three persons of the same name, *James GARET* the father, and *James* the son, and *Peter*, as I suppose, the brother of *James* the elder. *PARKINSON*, speaking probably of the last, informs us, that he was originally a druggist in *Lime-street*.

He was, I believe, the translator of à COSTA, as hath been before noted.

Mr. Bredwell, “ practitioner in physick, a
“ learned and diligent searcher of simples,”
in the west of *England*.

Mr. Nicholas LETE, a merchant of London, “ greatly in love with rare and faire
“ flowers, for which he doth carefully send
“ into *Syria*, having a servant there at
“ *Aleppo*, and in many other countries; for
“ which myself and the whole land are
“ much bound unto him.”

Dr. John MERSHE, of *Cambridge*.

Mr. James COLE, a merchant of *London*,
“ a lover of plants, and very skilful in the
“ knowledge of them.”

Among those of eminent station, who patronised the science, GERARD does due honour to Sir *Walter RALEIGH*; Lord *Edward ZOUCH*, the patron of *LOBEL*, who brought plants and seeds with him from *Constantinople*; and to Lord *HUNSDON*, Lord High Chamberlain of *England*, who, he says, “ is worthy of triple honour for
“ his care in getting, as also for his curious keeping, such rare and strange things
“ from the farthest parts of the world.”

C H A P. 10.

Johnson the improver of Gerard's book—*Anecdotes of—His Iter in Agrum Cantianum the first English local catalogue—Enters into the king's army, and is killed at the siege of Basing—His edition of Gerard—Mércurius Botanicus—Version of Parey's works.*

Contemporary assistants — Goodyer — Bowles — Tunstall — Glyn — Morgan.

J O H N S O N.

THOMAS JOHNSON was born at *Selby*, in *Yorkshire*, and bred an apothecary in *London*. He afterwards kept a shop on *Snow-Hill*, “where, by his un-
“wearied pains, advanced with good natu-
“ral parts,” says *Mr. Wood*, “he attained
“to be the best herbalist of his age in *Eng-*
“*land*.”

He was first announced to the public, by a small piece under the title of “*ITER IN AGRUM CANTIANUM*, 1629; *et ERICETUM HAMSTEDIANUM*, 1632 : which
were

were the firſt local catalogues published in *England*. He ſoon after acquired great credit by his new edition and emendation of GERARD'S "Herbal."

In the civil wars, his zeal for the royal cauſe led him into the army, in which he greatly diſtinguiſhed himſelf; and the univerſity of *Oxford*, in conſideration of his merit and learning, added to that of his loyalty, conferred upon him the degree of doctor of phyſic, May 9, 1643.

In the army, he had the rank of lieutenant colonel to Sir *Marmaduke RAWDON*, governor of *Baſinghouſe*. Mr. *Granger* informs us, that "he ſet fire to the *Grange*,
 " near that fortrefs, which conſiſted of
 " twenty houſes, and killed and burnt about
 " three hundred of Sir *William Waller*'s
 " men, wounded five hundred more, and
 " took arms, ammunition, and proviſions
 " from the enemy." Wood adds, "that
 " going with a party on the 14th of Sep-
 " tember, 1644, to ſuccour certain of the
 " forces belonging to that houſe, which
 " went to the town of *Baſing* to fetch pro-
 " viſions thence, but beaten back by the
 " enemy,

“ enemy, headed by that notorious rebel,
“ Colonel *Richard Norton*, he received a
“ shot in the shoulder, of which he died in
“ a fortnight after. At which time his
“ worth did justly challenge funeral tears ;
“ being then no less eminent in the garri-
“ son for his valour and conduct as a sol-
“ dier, than famous through the kingdom
“ for his excellency as an herbalist and
“ physician.”

I have mentioned Johnson's *Iter Can-
tanium*, and *Ericetum Hamstedianum* ; but
not having seen either, I can give no ac-
count of them.

In 1633, he published his improved edi-
tion of GERARD, under the title of “ The
“ HERBAL, or GENERAL HISTORY of
“ PLANTS, gathered by *John GERARD*,
“ of *London*, very much enlarged and a-
“ mended by *Thomas JOHNSON*, citizen and
“ apothecary of *London*, for *Islip* and *Nor-*
“ *ton*.” 1633. fol. ; and again 1636. pp.
1630.

An interval of thirty-six years, from the
date of *Gerard's* work, had effected a great
change in the state of botanical knowledge ;
many

many new plants had been introduced, and many valuable works published on the continent, particularly the *Hortus Eystettensis* in 1613, and the *Prodromus* of Bauhine in 1620. No publications had appeared at home, except such as were adapted to the Florist and Gardener; *Gasp*ar *Bauhine's* invaluable *Pinax* had facilitated and shortened the labour of consulting preceding authors. All these circumstances were favourable to JOHNSON; and his acknowledged superiority to GERARD in the learned languages, might justly raise the expectation of the public; insomuch that it becomes a matter of speculation, why JOHNSON acquiesced in the character of an editor only. It may indeed be converted into a strong presumption of the value set by the public on GERARD; which probably prevented the risk of a new title.

The general expectation was not disappointed. The advantages above noted enabled JOHNSON to amplify and improve his author to such a degree, that his book eminently deserves the *encomium* that HAL-
LER has bestowed upon it, when he calls

it “ *dignum opus, et totius rei herbariæ ævo nota, compendium.*”

After what has been said of the plan, as it stands in GERARD, it remains only to shew briefly what JOHNSON has done. In about twelve pages, he has prefixed a concise, candid, and judicious account of the most material writers on the subject, from the earliest ages to the time in which he wrote; concluding with a particular account of his own work, from its origin in Dr. PRIEST’S translation. After this follows a table, pointing out, with great precision, all his additions; by which we learn, that he enriched the work with more than eight hundred plants not in GERARD, and upwards of seven hundred figures, besides innumerable corrections. By procuring the same cuts that GERARD used, (to which collection a considerable accession had been made) and by having some new blocks cut, his work contained a greater number of figures than any Herbal extant; the whole amounting to 2717. He informs us, in an apology he makes for not inserting his additional matter in the edition of 1636, that

that he intended to travel throughout the kingdom in search of the more rare plants, and afterwards to comprise all his discoveries in an appendix.

In 1634, he published "MERCURIUS BOTANICUS; sive PLANTARUM gratia suscepti Itineris, anno 1634, DESCRIPTIO; cum earum Nominibus Latinis et Anglicis." Lond. 8vo. pp. 78.

It is dedicated to Sir Theodore MAYERNE, and others of the college, in his own, and the names of his associates in the excursion, who were all of the company of the Apothecaries. It was the result of a journey, through Oxford, to Bath and Bristol, and back by Southampton, the Isle of Wight, and Guildford, made with the professed design to investigate rare plants. He has described, in not inelegant Latin, their rout, which took up only twelve days, and the agreeable reception they met with among their medical acquaintance. We meet with a list of exotics, amounting to 117, cultivated by Mr. George GIBBS, a surgeon at Bath, who had made a voyage to Virginia, from whence he brought many new plants; which, as it exhibits the advanced state of

gardening in this country at that time, is now a matter of curiosity.

The plants of spontaneous growth enumerated in this short tour, varieties being excluded, exceed six hundred, which, at a time when the *cryptogamiæ* were scarcely noticed, and in the season when neither the very early nor late plants could be seen, is no inconsiderable number. In this catalogue are several not discovered in *England* before. With this tour JOHNSON gave his small tract, "*De Thermis Batbonicis, five earum descriptio, vires, utendi tempus, modus, &c.*" Lond. 1634. pp. 19. There are three small plans of the baths, and one of the city, which seem to be copied from Speed's map. These are now pleasing curiosities to the lovers of antiquity, and to all who contemplate the astonishing increase of the city since that time.

This was followed by "*PARS ALTERA, five PLANTARUM gratia suscepti Itineris in Cambriam seu Walliam* DESCRIPTIO." Lond. 1641. 8°.

JOHNSON, if not the first, was among the earliest Botanists who visited *Wales*, and *Snowdon*, with the sole intention of discovering

discovering the rarities of that country in the vegetable kingdom. The journey seems to have answered his purpose, and afforded him a rich harvest. In this expedition he first found the yellow poppy, *papaver cambricum*: mountain saw-wort, *ferratula alpina*: rose-root, *rhodiola rosea*; and several other plants.

I cannot ascertain the age of JOHNSON at his death, but there is reason to think he could not be far advanced in life, if indeed he was arrived at the meridian of it. I ground my opinion on the circumstance of LOBEL's total silence relating to him, in his *Adversaria*, printed in 1605. Engaged as JOHNSON was, in the exercise of a profession, which, independent of the calls of duty, demands much sacrifice of time, to the forms and civilities of life, his HERBAL is an ample testimony of zeal and industry. I do not find that he was the author of any other publications, than those, of which I have given some account; but, he translated the works of Ambrose PAREY, which he published at London in 1643. They were reprinted, if I mistake not,

for the last time in 1678. This excellent man, who in the character of surgeon, successfully served four sovereigns of *France*, was attached to the protestant cause; and for his extraordinary merit, and his having cured *Charles IX.* of a tendon wounded in bleeding, was saved from the massacre of *St. Bartholomew*. He survived this event 19 years, and died in 1590. His works were collected by himself, in 1582, in folio, and ran through nine or ten editions on the continent. PAREY's improvements in his profession had been singularly important; there can be no doubt, therefore, that our author performed a very acceptable service to his countrymen, by putting his writings into an English dress *.

* MILLER consecrated the name of JOHNSON by assigning it to a berry-bearing shrub of *Carolina*, belonging to the *tetrandrous* class; first figured by PLUKENET, *tab.* 136. f. 3. and since by CATESBY, *vol.* 2. *tab.* 47. The English Botanists, who must consider JOHNSON as entitled to so honourable a distinction among their worthies, will regret that his name should not be retained in the Linnæan system, in preference to *Callicarpa*, by which term this shrub is now well known in the English gardens.

Before

Before JOHNSON is dismissed, it would be unjust not to notice some of those, to whom the author was especially indebted for assistance, and for the communication of English plants. Among these, the first place is due to Mr. *John* GOODYER, of *Maple Durham*, in *Hampshire*, whose name occurs repeatedly in GERARD'S "Herbal," and very frequently in PARKINSON'S, in which he is stiled "a great lover and "curious searcher of plants; who, besides "this" (speaking of the *geranium saxatile*) "hath found in our country many "other plants, not imagined to grow in "our land." He seems not only to have been what may be called a *practical* Botanist, but learned, and critically versed in the history of the science. This may be fairly inferred from his curious communication, relating to the manuscripts under the name of APULEIUS *Madaurensis*, and from his observations on the *saxifrage* of the ancients, inserted at p. 604. The great number of rare English plants, which Mr. GOODYER first brought to light, entitles

him to the most reputable rank among those who have advanced the botanical knowledge of this kingdom.

Mr. *George BOWLES*, of *Chiffelhurst*, in *Kent*, also distinguished himself by his successful investigation of many new plants. He spent some time in *Wales*, where his discoveries were very ample; and he is mentioned with particular attention, in numerous instances, by our author.

The names of *JOHNSON*'s associates in his Kentish, and other simpling excursions, occur in the preface; and in the body of the work we meet also with the following:

John TRADESCANT the elder, who became famous afterwards for his fine garden, and museum of natural curiosities.

Sir *John TUNSTAL*, gentleman usher to the queen, is recorded as possessing a garden at *Edgcome* in *Surrey*, stored with plants, which are said to have belonged to the queen.

Mr. *Thomas GLYN*, who first found that elegant plant the *gnaphalium marinum*, on the coast of *Wales*.

Mr.

Mr. *Hugh* MORGAN, apothecary to the queen, before mentioned under the article of LOBEL,

Mr. *Robert* ABBOT, of *Hatfield*, near *St. Albans*, a learned preacher, and an excellent and diligent herbarist.

BOELIUS or BOEL, of whom further notice more properly comes under the article of PARKINSON.

Mr. *John* REDMAN, "a skilful herbarist," an inhabitant of the northern part of England.

Frequent and respectable notice is also taken of Mr. *John* PARKINSON, the subject of the succeeding article: His *Paradisus Terrestris* is much commended, and his garden referred to as abounding in choice plants.

C H A P. II.

Parkinson—*Brief account of his life—His Paradisus : the best view of the state of the flower garden in that age—Theatrum Botanicum : a more original and laboured performance than Gerard's Herbal—Its merit not sufficiently acknowledged by his successors.*

Boel : *and other contemporaries of Parkinson.*

P A R K I N S O N .

JOHNSON PARKINSON was born in 1567. I regret that I am not enabled to supply a more ample account of this laborious man, whose learning and abilities appear to me not to have been justly appreciated. He was bred an apothecary, and lived in *London*. He was contemporary with GERARD and LOBEL, during the latter part of their lives ; and survived JOHNSON several years. LOBEL, in the second part of his *Adversaria*, and JOHNSON, in his *Gerardus Emaculatus*, speak of him as a man of eminence in his profession, and as possessed of
6 a garden

a garden well stored with rarities. In fact, he rose to such a degree of reputation as to be appointed apothecary to King *James*; and at the publication of his “*Theatre of Plants*,” he obtained, as we learn by Sir *Theodore* *MAYERNE*’s commendatory letter prefixed to it, the title from *Charles* the First of *Botanicus Regius Primarius*. The time of his death I cannot ascertain; but, as his “*Herbal*” was published in 1640, and he appears to be living at that time, he must have attained his 73d year. There is a print of him prefixed to his *Paradisus*, in the 62d year of his age, and a small oval one, in the title of his “*Herbal*,” or “*Theatre of Plants*.”

His first publication was the “*PARADISI IN SOLE PARADISUS TERRESTRIS*;
 “or, a garden of all sorts of pleasant flowers,
 “which our English ayre will permit to be
 “nursed up: with a kitchen garden of all
 “manner of herbs, roots, and fruits, for
 “meat or sause, used with us, and an orchard of all sorte of fruit-bearing trees and
 “shrubbess fit for our land; together with
 “the right ordering, planting, and preserv-
 “ing

"ing of them, and their uses and vertues,
"Collected by *John* PARKINSON, apothecary of London 1629." Folio, pp. 612,

There was a second edition published after the author's death, corrected and enlarged, in 1656.

As the subject of this book interests the florist and gardener merely, it comes less within the scope of this work than his "Herbal." It is dedicated to *Queen Elizabeth*; and, agreeably to the panegyric custom of the times, is set off with commendatory verses; among which we meet with some in Latin from *Thomas* JOHNSON, doubtless the editor of GERARD, and a Latin letter, in a high strain of eulogy, from Sir *Theodore* MAYERNE.

The plants are arranged without any other order than that expressed in the title page. Garden flowers are divided into 134 chapters, according to the generical names of the time; kitchen plants into 63 chapters; fruit trees and shrubs into 24 chapters; and a corollary of 22 species. Nearly one thousand plants are separately described; of which seven hundred and eighty are figured

ed on one hundred and nine tables, which appear to have been cut on purpose for this work. Many are copied from CLUSIUS and LOBEL. The figures are less commendable for the design than the execution, and are much inferior, on the whole, to those of GERARD'S "Herbal." In the Latin names, the author has made use principally of *Casper* BAUHINE; some are taken from LOBEL. The mode of arrangement in each chapter is similar to that of GERARD. After the description of all the species, follow the place, time of flowering, synonyms, and virtues. Less is spoken of the culture than seems to be requisite.

Several Englishmen had written on gardening and agriculture in the sixteenth century, of whom the first on husbandry, as far as I can find, was *Antony* FITZHERBERT, a famous lawyer and justice of the King's Bench, whose "Booke of Husbandrie" was printed first in 1534. One of the earliest, if not the first on gardening, is *Thomas* HILL, "His profytable Art of Gardening," printed in 1574. The next was, "The new Orchard and Garden," by
William

William LAWSON, in 1597. In 1600, Sir *Hugh* PLATT, the author of many other useful tracts, put forth his "Garden of "Eden;" a book of great merit in its time. All these passed through numerous editions, and the last preserved credit to the end of the century.

PARKINSON however, as I apprehend, was the first author, who separately described and figured the subjects of the *Flower Garden*. The *Paradisus Terrestris* is therefore, at this time, a valuable curiosity, as exhibiting the most compleat view of the extent of the English garden at the beginning of the last century. Intertropical productions had been but sparingly imported. The real stove plants are very rare throughout the book. There are some American species, and particularly from *Virginia*, as being a part of that continent with which *England* had the most frequent intercourse. But the principal productions of the English gardens were exotic European, and Grecian plants, some Asiatic, and a few from the northern coasts of *Africa*.

A modern florist, wholly unacquainted
with

with the state of the art at the time PARKINSON wrote, would perhaps be surprized to find that his predecessors could enumerate, besides sixteen described as distinct species, one hundred and twenty varieties of the *tulip*, sixty *anemonies*, more than ninety of the *narcissus* tribe, fifty *hyacinths*, fifty *carnations*, twenty *pinks*, thirty *crocuses*, and above forty of the *iris* genus. In the orchard we find above sixty kinds of *plums*, as many *apples* and *pears*, thirty *cherries*, and more than twenty *peaches*.

In 1640, PARKINSON published his
 “ THEATRUM BOTANICUM; or, Theatre
 “ of Plants, or an Herbal of a large extent:
 “ containing therein a more ample and ex-
 “ act history and declaration of the physical
 “ herbs and plants that are in other au-
 “ thors; encreased by the access of many
 “ hundreds of new, rare, and strange
 “ plants from all the parts of the world,
 “ with fundry gummes, and other physical
 “ materials, than hath been hitherto pub-
 “ lished by any before: and a most large
 “ demonstration of their nature and virtues.
 “ Shewing withal, the many errors, differ-
 “ ences,

“ences, and oversights of sundry author’s
“that have formerly written of them, and
“a certain confidence, or most probable
“conjecture of the true and genuine herbs
“and plants: distributed into sundry classes
“or tribes, for the more easy knowledge
“of the many herbs of one nature and
“property, with the chief notes of Dr.
“*Lobel*, Dr. *Bonham*, and others, inserted
“therein.” London. Folio. pp. 1746.
SEGUIER mentions an edition in 1656,
which I never saw, and suspect it was not
a new impression.

This work was the labour of PARKIN-
SON’S life, and was not published until he was
arrived at a very advanced period. He tells
us, in the preface, that, owing “to the dis-
“astrous times,” and other impediments,
the printing of it was long retarded. Ori-
ginally it was intended to have contained
only the medicinal herbs, under the title
of “A physical Garden of Simples,” but
he enlarged his plan, and endeavoured to
comprehend all the Botany of his time. It
is manifest, even from a cursory view of it,
that it is a work of much more originality
than

than that of GERARD; and it contains abundantly more matter than the last edition of that author, with all JOHNSON's augmentations. In the general disposition of the subject, the order is chiefly founded on the known, or supposed qualities, and virtues of the plants; being divided into seventeen tribes, as follow:

1. *Plantæ odoratæ*. Sweet-smelling plants.
2. *Catharticæ*. Purging plants.
3. *Venenatæ, narcoticæ, nocivæ, et alexipharmicæ*. Venemous, sleepy, and hurtful plants, and their counterpoisons.
4. *Saxifragæ*. Saxifrages, or break-stone plants.
5. *Vulnerariæ*. Wound herbs.
6. *Refrigerantes, et intubacææ*. Cooling, and succory-like herbes.
7. *Calidæ, et acres*. Hot, and sharp-biting plants.
8. *Umbelliferæ*. Umbelliferous.
9. *Cardui, et spinosæ*. Thistles, and thorny plants.

10. *Filices, et herbæ capillares.* Ferns, and capillary herbes.
11. *Legumina.* Pulses.
12. *Cerealia.* Corn.
13. *Gramina, junci, arundines.* Grasses, rushes, and reeds.
14. *Paludosæ, aquaticæ, marinæ, musci, et fungi.* Marsh, water, and sea plants, mosses, and mushrooms.
15. *Miscellaneæ.* The unordered tribe.
16. *Arbores, et frutices.* Trees, and shrubbes.
17. *Exoticæ, et peregrinæ.* Outlandish plants.
18. *Appendix.*

This heterogeneous classification, which seems to be founded on that of *Dodoens*, sometimes on the medicinal qualities, sometimes on the habit, and on the place of growth, shews the small advances that had been made towards any truly scientific distribution. On the contrary, both GERARD, JOHNSON, and PARKINSON, had rather gone back, by not sufficiently pursuing the example of LOBEL.

In

In the particular disposition of the subjects, under each chapter or genus, PARKINSON follows the rules of GERARD, and JOHNSON, by giving, after the Latin and English name, the descriptions at large; then the place of growth, and time of flowering; the synonyms, and lastly, the virtues and uses.

Nice discrimination of species from each other, or from varieties, must not be expected in this work, more than in GERARD, or his *Emaculator*. Almost every Botanist was then a Florist too. CLUSIUS himself, who had enlarged the science, by his own discoveries, beyond any other man, continued to raise tulips from seed, for more than 35 years. PARKINSON's "*Paradisus*" proves his attachment to the Flower Garden, in the early part of his life; and this bias influenced him throughout the "Theatre of Plants." As yet, no line had been drawn with sufficient accuracy, between species and variety, between nature and the effect of culture, or of soil and situation, nor was this brought about till the essential parts of vegetables, the flower, and the fruit, became

objects of classification, instead of the vague distinctions hitherto observed; of which it may be sufficient to adduce one example, out of hundreds equally futile. The sea cabbage, (*brassica orientalis*) a *siliquose* plant, is ranked by GERARD and JOHNSON, as well as by PARKINSON, even contrary to the examples of CLUSIUS and DODONÆUS, under the same generical name with the thorow wax, (*bupleurum*) an *umbelliferous* plant, merely because the leaf is of the *perfoliate* kind.

These are defects common to the age, and PARKINSON must not be appreciated by modern improvement, but by comparison with his contemporaries. In this view, if I am not mistaken, he will appear more of an original author than GERARD, or JOHNSON, independent of the advantages he might derive from being posterior to them. His "*Theatre*" was carried on thro' a long series of years, and he profited by the works of some late authors, which, though equally in JOHNSON's power, he had neglected to use. PARKINSON's descriptions, in many instances, appear to be new. He is
more

more particular in pointing out the places of growth. In the enumeration of the synonyms, he has not only given nearly the whole of BAUHINE's "*Pinax*," but, very frequently, has himself consulted the original authors, and enters minutely into a discussion of their doubts. In the account of the virtues, and uses, PARKINSON is diffuse. It was his professed design to make his work a *Materia Medica*; and if, in him, we meet with the qualities of plants estimated on Galenical principles, by the degrees of hot and cold, moist and dry, &c. it was the theory of the day, from which authors of higher eminence were not emancipated. He not only gives the opinions of the Greek and Roman physicians, but of the Arabians, and has translated from the moderns, and his contemporaries, whatever could illustrate his subject, and render it as perfect as the intelligence of the times would allow. To this end he has extracted largely from CLUSIUS's "*Exotics*," from D'ACOSTA, MONARDES, and GARCIA ab HORTO on the drugs and simples of the East and West Indies; of which, at that

time, many were newly introduced, and imperfectly known.

PARKINSON's work is much more extensive than JOHNSON's, in the number of subjects described, he having taken, as before observed, advantages which the *Emaculator* of GERARD neglected. Many of the plants of *Ægypt*, from *Prosper* ALPINUS, many of the North American, or Canadian plants, from CORNUTUS, and some from COLUMNA's work, are introduced. He neglected no opportunities of procuring new plants from abroad. The nature of his profession did not allow him to make distant or frequent excursions in *England*; but, by the assistance of his correspondents, and some of LOBEL's posthumous writings, which he purchased, he was enabled to enlarge, not only the catalogue of British plants, but to introduce many exotics before unknown.

JOHNSON had described about 2850 plants, PARKINSON has near 3800. These accumulations rendered the "THEATRUM BOTANICUM" the most copious book on the subject in the English language;

guage; and it may be presumed, that it gained equally the approbation of medical people, and of all those who were curious and inquisitive in this kind of knowledge. Both this work, and GERARD's afterwards, acquired consequence by the references of Mr. RAY, who may be said, in the language of the *Catalogus Oxoniensis*, to have raised them to classical eminence in English Botany, and preserved them from oblivion as long as his own works remain. Without any design of depriving JOHNSON of his due praise, yet it is obvious, from the recollection of certain circumstances, that PARKINSON laboured under disadvantages and impediments, which probably tended to depress his work at the time, although it had undoubtedly been carrying on through a longer series of years than *Johnson's*, and was more copious in its design.

JOHNSON had the opportunity that GERARD himself obtained, of procuring all the cuts from abroad. PARKINSON's, on the other hand, though copied from the same figures, appear to have been cut anew, purposely for his work. The delay occa-

sioned by this circumstance, besides the great expence, was, probably, among the obstacles the author complains of, which so long retarded the publication of his work. Add to this, that the figures were after all inferior to the old tables, both in number and execution. JOHNSON's exceed those of PARKINSON, by more than an hundred. Both these works may be considered as *Digests* of the Botany of the age, in the English tongue ; but it is to be feared the same censure lies against them which *Caspar* BAUHINE lodged against DALECHAMP's history, published in 1588, in which he demonstrated, that more than 400 plants were twice described.

Nor is it wonderful that the attempt to comprehend, and discriminate the whole vegetable kingdom, was a plan too extensive for one man, especially in the augmented state in which PARKINSON found it. The magnitude of the design necessarily involved a multitude of errors, and exposed both GERARD and PARKINSON to the censures of malignant critics. Had the candour of LOBEL been equal to his learning

learning and knowledge, he had spared much of his acrimony against these industrious writers, whose laudable endeavours rather merited his applause.

Among those contemporaries, whose collateral assistance is acknowledged by PARKINSON, Mr. (or, as he is styled in some parts of the work, *Dr.*) William BOEL claims particular notice. He was a native of the Low Countries, and had travelled into various parts of *Germany* and *Spain*; had been in *Barbary*, resided at *Tunis*, and, at the publication of “the Herbal,” lived at *Lisbon*. From all these countries he sent seeds of many plants before unknown in *England*. He was the correspondent of CLUSIUS, and seems to have been very zealous for the improvement of natural knowledge.

Mr. *John* GORDIER, “a great lover
“and curious searcher of plants, who, be-
“fides this,” (speaking of the *Geranium*
lucidum) “hath found in our country other
“plants, not imagined to grow in our
“land.

In PARKINSON’S works we also find the
name

name of Mrs. *Thomazin* TUNSTAL, a lady whom he celebrates, not only for her taste in cultivating a garden which was well stored with exotics, but for her knowledge of *English* botany, and her discoveries of several curious vegetables found about *Ingleborough Hill*, in *Lancashire*; which were not known before to grow in *England*. Whether she was allied to Sir *John* TUNSTAL, noticed in the account of JOHNSON, I cannot ascertain.

Besides the names of BOWLES, GOOD-YER, TRADESCANT, and others, mentioned by JOHNSON, we meet with the following, as having contributed to the general stock. *John* NEWTON, surgeon, at *Colliton*, *Somersetshire*; Dr. *Antony* SADLER, physician at *Exeter*; Mr. *William* QUICK, apothecary, *London*; Mr. BRADSHAUGH, of *Yorkshire*; Mr. SILLIARD, of *Dublin*, and divers others*.

* PARKINSON is commemorated for his botanical labours by PLUMIER, in having his name applied to a decandrous tree, a native of the *Caribbee* islands, and of the adjacent continent, well known in the English stoves, and called in *Jamaica* the *Jerusalem thorn*.

C H A P. 12.

History of wooden cuts of plants—Plantin's accumulation of these figures—Fate of Gesner's excellent engravings—Of those to the Herbals of Turner, Gerard, and Parkinson—Parkinson's the last of importance (except Salmon's) which were exhibited in England—First copper-plates of plants.

WOODEN CUTS.

AS we are now arrived at the period, when wooden cuts were about to be superseded by engravings on metal, PARKINSON'S "Herbal" being the last of any importance in which they were used in *England*, it may not be incongruous to our plan to notice the origin and progress of that art, which contributed not a little to facilitate the knowledge of plants. Rude as these representations were, compared with the elegance of modern times, yet, in an age when specific distinctions were not fixed, and the diagnostic of the plant depended

pended so much on habit, they spoke to the eye, and often discriminated the subject, when the laboured description failed.

It has been before observed, that SEGUIER is of opinion the first Herbal with wooden cuts was the "*Puch der Natur*," "The Book of Nature," printed at *Augsburgh*, in 1478, if not three years earlier. These are thought to have passed into the HERBARIUS, printed at *Mentz* in 1484; from which book was compiled the ORTUS SANITATIS, printed at the same place in 1485; with improvements in the work in general, and better figures, by CUBA. Of this work some notice has before been taken, as the foundation of the English "*Grete Herbal*," first printed here in 1516.

The HORTUS SANITATIS was translated into various languages, and in some new-modelled, without concealing its origin, according to the fancy of different editors and printers; and passed through innumerable editions on the Continent; having been the popular book on the subject, as the "*Grete Herbal*" was in England, for fifty or sixty years.

It does not appear that CUBA was publicly known as the author of the HORTUS SANITATIS, until EGENOLF, a bookfeller of *Frankfort*, gave an improved edition, with an entirely new set of figures, under the care of EUCHARIUS RHODION or ROESLIN, a physician of the same city, in 1533. *Egenolf's* book passed through various editions, until a better work was composed by DORSTEN, under the title of "*Botanicon*," in 1540, at *Frankfort*; in which the same figures were employed. They were used also in the "*Encyclopædia Medica*" of J. DRYANDER, in 1542; and in the succeeding year, in an edition of DIOSCORIDES, by *Hermann Ryff*, printed by *Egenolf*. Finally, ADAM LONICER, the son-in-law of *Egenolf*, having totally reformed the work of CUBA, employed them in his *Herbal*, printed in 1546. In succeeding editions, he introduced new figures, took others from TRAGUS to the number in the whole of 880, and composed a work, which passed through a great number of editions, and was not superseded in the present century, as appears by an edition printed

printed so lately as in 1723, and even in 1737.

We are informed by TRAGUS, that *Ege-nolf* spared no expence in the encouragement of artists to procure these icons, rude and imperfect as they appear to us. He secured to himself, by this means, the monopoly of printing *Herbals*, for a succession of years; and acquired both fame and riches.

At length, these were all superseded by those of BRUNSFELSIUS to his *Herbal*, printed in 1532; which were drawn from nature, and appear to have been the first that were worthy of notice. These were, however, greatly excelled by FUCHSIUS, in 1542; whose figures, although only outlines, are uncommonly beautiful, and not less just. They consist of five hundred figures in folio, of the most common and useful plants; and were copied, in a smaller scale, by many succeeding authors. TRAGUS took most of them into his "History of German Plants," to which he added many new ones, to the amount in all of 567. Those of TRAGUS are little more

†

than

than outlines ; and, allowing for the time, they sufficiently well express the habit of most of the subjects.

Egenolf having set the example, printers, after this time, themselves bore the expence of cutting the blocks ; by which means, certain printers monopolised the printing of *Herbals* ; and a kind of commerce between them and authors took place, and mutual exchanges were made for the use of each other's books. Among these, no one possessed at length a greater collection than the famous PLANTIN, of *Antwerp* ; who recommended himself so highly by the excellency of his types, and mode of executing his works. Hence he became the common printer to several of the celebrated botanic writers of the sixteenth century. When CLUSIUS published his French translation of DODOENS, with *Loe*, at *Antwerp*, he gave figures copied from FUCHSIUS ; all which *Plantin* bought. He afterwards acquired the figures cut for CLUSIUS's own works, and those of LOBEL. DODONÆUS, besides some new blocks, had the use of all the above in the "*Pemptades*," in 1584, which work contains 1300 figures. TABERNÆ-

MONTANUS

MONTANUS obtained the use of this collection, namely, those of FUCHSIUS, CLUSIUS, LOBEL, and DODONÆUS; to which he added those of MATTHIOLUS; inasmuch that his Herbal, printed at *Frankfort* in 1588, comprehends more than two thousand figures. DALECHAMP, in his "General History of Plants," printed about the same time, augmented them to near two thousand seven hundred.

The fate of GESNER's excellent figures I can but briefly mention; it forms a mortifying, but curious anecdote, in the literary history of the science. Of the fifteen hundred figures left by GESNER, prepared for his "History of Plants," at his death, in 1565, a large share passed into the "*Epitome Matthioli*," published by CAMERARIUS in 1586, which contained in the whole 1003 figures; and in the same year, as also into a second edition in 1590, they embellished an abridged translation of MATTHIOLUS, printed under the name of the "German Herbal." In 1609, the same blocks were used by *Uffenbach* for the Herbal of CASTOR DURANTES, printed at *Frankfort*. This publication, however, comprehends

comprehends only 948 of these icons, nearly another hundred being introduced of very inferior merit. After this period, CAMERARIUS the younger being dead, these blocks were purchased by *Goerlin*, a bookseller of *Ulm*; and next served for the "*Parnassus Medicinalis illustratus*" of *BECHER*, printed at that city in 1663; the second part of which work contains all those of the "*Epitome*," except six figures. In 1678, they were taken into a German Herbal, made up from *MATTHIOLUS*, by *Bernard VERZASCHA*, printed at *Basil*; and such was the excellency of the materials and workmanship of these blocks, that they were exhibited a sixth time in the "*Theatrum Botanicum*," or *Kräuterbuch* of *ZWINGER*, being an amended edition of *VERZASCHA*, printed also at *Basil* in 1696, with the addition of more than one hundred new blocks, copied from *C. BAUHINE* and *TABERNÆMONTANUS*; and finally, into a new edition of the same work, so late as the year 1744.

Thus did the genius and labours of *GESNER* add dignity and ornament to the works of other men, and even of some whose enmity he had experienced during his life-time.

Besides the above mentioned, GESNER left five volumes, consisting entirely of figures, which, after various vicissitudes, became the property of TREW, of *Norimberg*. Sensible that whether we view the extent of GESNER's knowledge and learning, or his singular industry, such must be the veneration for his character, that any of his remains must claim the attention of the curious, the possessor gratified the public, by the pen of Dr. SCHMIEDEL, with an ample specimen, published in 1753.

Thus far for foreigners. The rude icons of the "*Grete Herbal*," it has been observed, were evidently copied from those in the *HORTUS SANITATIS*; for that they were not the same tables, appears from the diminished size. Of the figures in TURNER's *History*, which amount to upwards of 500; the greater part are those of FUCHSIUS's octavo set; and the remainder, nearly 100, were new. LYTE printed his translation of DODOENS with *Loe*, at *Antwerp*, for the conveniency of his figures, which are also borrowed from FUCHSIUS; to which LYTE added about thirty new ones.

GERARD, in 1597, and JOHNSON, his

"*Emacu-*

"*Emaculator*" afterwards, in 1633 and 1636, procured all the blocks from *Frankfort*, with which the Herbal of TABERNÆMONTANUS had been illustrated. JOHNSON by this means accumulated upwards of 2700 cuts.

The blocks for PARKINSON'S "*Theatrum*," and his "*Paradisus*," were, I apprehend, cut in *England*; and those for the first seem to be copies from GERARD, though much inferior in execution. The last of the kind used in *England*, were a new set cut for SALMON'S "*Herbal*," in 1710; except, I believe, those for a very indifferent performance, under the name of "*An Herbal*," published since that time, in quarto.

The earliest copper-plates of plants on the Continent, are said to be those of *Columna* in his "*Phytobasanos*," in 1592. In *England*, except some single figures, and the few plates in the first edition of PLOT'S "*Oxfordshire*" in 1677, those of the "*Historia Oxoniensis*" are the first exhibition of any great work; and of these, the grasses are, to this time, perhaps unparalleled in the neatness and accuracy of the execution.

C H A P. 13.

The botanical Garden founded at Oxford by Henry Earl of Danby—Jacob Bobart the first Intendant—Two editions of the Catalogus Oxoniensis—Account of the authors, the Bobarts, Stephens, and Browne.

Dr. How, some account of—His Phytologia the first English FLORA, or separation of English from exotic botany—The author's assistants in this work, Stonehouse, Bowles, and others—How, the editor of Lobel's posthumous Illustrationes.

H O R T U S O X O N I E N S I S.

HITHERTO Botany, however successfully it might have been cultivated by individuals in *England*, had received no encouragement from any public institutions; but the time was now arrived, when it acquired additional vigour and improvement from the foundation of a physic-garden at *Oxford*. These elegant and necessary aids to science had considerably multiplied since the first foundations of
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the kind, before noticed, in *Italy* and elsewhere. Several universities in the more northern and western parts of *Europe* had procured the establishment of gardens: *Paris*, in 1570; *Leyden*, in 1577; *Leipsic*, in 1580; *Montpelier*, in 1598; *Jena*, in 1628; and *Oxford*, in the year 1632. This last was owing to the munificence of HENRY Earl of *Danby*, who gave for this purpose five acres of ground, built green-houses and stoves, and an house for the accommodation of the gardener, endowed the establishment, and placed in it, as the supervisor, *Jacob BOBART*, a German from *Brunswick*, who lived, as *WOOD* tells us, in the garden-house, and died there on February 4, 1679. A list of the plants was published, under the title of “*CATALOGUS PLANTARUM Horti medici OXONIENSIS Latino-anglicus et Anglico-latinus: alphabetico ordine.*” Oxon. 1648. 12°. pp. 54 and 51. *DILLENII* informs us, that *BOBART* drew up this catalogue. In the preface we are told the garden contained 1600 species, by which must be understood both exotic and indigenous, including varieties of each. The

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plants

plants are barely enumerated, without any synonyms, or references to any author. The number of English species recited, extends to 600, or nearly. The copiousness of this catalogue sets the zeal and diligence of BOBART in a favourable light. Under his care, and that of his son, the garden of *Oxford* continued to flourish for many years.

The CATALOGUS OXONIENSIS was republished in the year 1658, in a much improved state, by the joint assistance of Dr. STEPHENS, Mr. *William* BROWNE, and the two BOBARTS, father and son, under the following title, "CATALOGUS HORTI BOTANICI OXONIENSIS, *alphabetice digestus, duas præterpropter, plantarum cibildas complectens, priore duplo auctior, idemque elimatior, nec non etymologiis, qua Græcis, qua Latinis, hinc inde petitis, enucleatior : in quo nomina Latina pariter et Græca vernaculis ; et in ejus sequiore parte, vernacula Latinis præponuntur. Cui accessere plantæ minimum sexaginta suis nominibus insignitæ, quæ nullibi nisi in hoc opusculo memorantur. Curâ et operâ sociâ Philippi STEPHANI, M. D. et Gulielmî*

Gulielmi BROUNE; A. M. adhibitis etiam in consilium D. ROBERTO patre, hortulano academico ejusque filio, utpote rei herbarice callentissimis." Oxon. 1658. 8°. pp. 214.

Of Dr. Philip STEPHENS, whose name stands first among the authors of this catalogue, we find little mention elsewhere, as eminent in botanical science. He was born at the *Devizes* in *Wiltshire*, and was first of St. Alban's Hall, *Oxon*; afterwards made Fellow of New College by the visitors, and became Principal of *Magdalen Hall*. He died at *London* after the Restoration.

MERRET, without any notice of Dr. STEPHENS, expressly calls Mr. BROWNE the author of this *Catalogue*; and *Wood* says, that he had the chief hand in it. *William BROWNE* was a native of *Oxford*, became Bachelor of Divinity, and Senior Fellow of *Magdalen College*. He died in March 1678, aged about 50, and was buried in the outer chapel of his college.

In this enlarged edition, the authors have, in every instance where it was possible, not only adopted the specific appellations given by GERARD and PARKINSON to each

plant, but quoted the page of their works: This is the first book, as far as I know, on the subject, printed in *England*, in which the latter of these circumstances takes place. It is remarkable, that so obvious an assistance, after having been introduced by *Caspar BAUHINE* in his "*Phytopinax*," should be wanting in the "*Pinax*" itself. Had *GERARD* and *PARKINSON* retained, throughout their works, the exact synonyms of the authors from whom they transferred their plants, and quoted the pages, they would unquestionably have rendered their writings much more useful to posterity, and have preserved them from disuse and oblivion, for a much longer period. The same may be observed of *Mr. RAY*, who has totally neglected this valuable improvement. So novel was the practice, that the authors of the *HORTUS OXONIENSIS* thought it necessary to apologise for it, and shield themselves under the authority of the "*Hortus Eystettenfis*."

There are many dubious and ill-ascertained plants in this Catalogue; and those marked as new, are almost wholly varieties. English Botany seems to have received little

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or no accession by it; and I am not aware of one indigenous plant first mentioned in this list.

The second part, or alphabetical list of English names, is intended only to lead to the Latin generical term in the first part.

H O W.

Until this period, no attempts had been made in *England* to separate the indigenous from exotic botany. It is true, Dr. JOHNSON, as before mentioned, had published local catalogues of the plants of certain districts; but no one had essayed a general list or description of the English plants alone, in the way of what is now called a *Flora*: a term, which, as far as I can find, was first adopted by Simon PAULI, for a catalogue of the plants of *Denmark*, published in 1648. It is to Dr. How that we owe the first sketch of a work of this kind; and, though he does not entitle his book *Flora*, he yet mentions that term in his preface.

William How was born in *London* in the year 1619, and educated at Merchant Taylors school. He became a commoner of St. John's college, *Oxford*, at eighteen; he
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took his bachelor's degree in 1641, and that of master of arts in 1645; and entered on the physical line. It does not appear that he ever took his doctor's degree, though he was commonly called Dr. How. With many other scholars of that time, he entered into the king's army, and for his loyalty was promoted to the rank of captain, in a troop of horse. Upon the decline of the royal cause, he prosecuted his studies in physic, and practised in that faculty. He lived first in St. Lawrence Lane, and afterwards in Milk Street. He died about the beginning of September 1656, and was buried by the grave of his mother, in St. Margaret's church, *Westminster*; leaving behind him, as Mr. *Wood* says, "a choice library of books of his faculty, and the character of a noted herbalist."

Dr. How's principal publication, and for which he is here recorded, bears the following title:

"PHYTOLOGIA BRITANNICA, *natales exhibens indigenarum Stirpium sponte emergentium.*" Lond. 1650. 12°. pp. 133.

The plants are arranged in the alphabetical order of the *Latin* names, with one or two

two synonyms, taken, as best pleased the author, from various writers on the continent, as well as from GERARD, PARKINSON, and LOBEL. The place of growth to each plant is noticed, and the particular spots where the rare ones grow, are specified. The list contains 1220 plants, which (as few mosses and fungi are enumerated) is a copious catalogue for that time, even admitting the varieties, which the present state of botany would reject.

The author of this little volume was unquestionably a man of very considerable learning, and had a strong passion for the knowledge of plants ; but his situation in life does not seem to have allowed him the opportunity of travelling into the various parts of *England*, to gratify his taste in *English* botany, with which he was not critically and extensively acquainted. Mr. RAY, in the preface to his "*Catalogus Plantarum Angliæ*," has given a list of more than thirty species in the "*Phytologia*," which have no title to a place as indigenous plants of *England*. Some of these being inhabitants of
Southern

Southern Europe; others evidently the accidental outcasts of gardens; and some, as certainly, mistaken for other plants, as appeared from the impossibility of finding them in the spots which How had pointed out.

The rare plants were almost wholly communicated by his friends, Mr. STONEHOUSE, Dr. BOWLES, Mr. HEATON, Mr. LOGGINS, Mr. GOODYER, and others. He drew some from a manuscript of Dr. JOHNSON, the editor of GERARD. I wish it were in my power to commemorate these persons in a more ample manner, who, at an early period, contributed to extend and illustrate English botany. Mr. STONEHOUSE, in particular, has deserved highly of the lovers of this science. He appears to have travelled much in *England*, from his recording the plants discovered by him in many counties. In *Yorkshire* he was particularly conversant; and, I conjecture, he lived at a place called *Darfield*, near *Barnsley*, in that county.

Dr. BOWLES, and Mr. GOODYER, are, I believe, the same persons mentioned under the

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the article of JOHNSON. Of Mr. HEATON, I shall take further notice in the sequel of these anecdotes.

It has been observed, that some of LOBEL's papers fell into the hands of PARKINSON, and some into Dr. How's possession. These were the fragment of LOBEL's great work, which How published in 1655, under the subsequent title:

“*Matthiæ de LOBEL, M. D. botanographi regii eximii, STIRPIUM ILLUSTRATIONES, plurimas elaborantes inauditas plantas subreptitiis Joh. PARKINSONI rapsodiis (ex codice M. S. insalutato) sparsim gravatæ, ejusdem adjecta sunt ad calcem Theatri Botanici Αμαρτυρία. Accurante Guil. How, Anglo.*”
Lond. 1655. 4°. pp. 170.

This work has been noticed under the article of LOBEL. It is sufficient to observe here, that the notes which the editor has affixed, would almost persuade the reader that he had published the work with a view to take an invidious retrospect of PARKINSON's “Theatre.” In the preface to the “*Phytologia*,” and in that of this work, both written in a flowery and bombast stile, as well

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as throughout the notes, he speaks of PARKINSON in very contemptuous language, and represents him as having made LOBEL's observations his own, without acknowledgment. Whatever may have been the case in particular instances, the attack, on the whole, was uncandid; since PARKINSON, in the very title of his "*Theatre*," professes to have made use of, and inserted, Dr. LOBEL's notes, together with those of Dr. BONHAM and others. In fact, there is a petulance and an acrimony in the style, both of the author and of the editor of this work, which, howsoever exemplified in the last age, is, happily, much less frequently the language of literature in the present.

C H A P. 14.

Some account of the Tradescants, father and son—

The first who formed a museum of natural history in this country—Account of Tradescant's publication—The museum bequeathed to Ashmole.

The astrological herbalists: Robert Turner, Culpepper, and Lovel—The last the most respectable of the sect in that time—Account of his Pambotanologia — Pechey's Herbal — Salmon—An account of his Herbal.

T R A D E S C A N T.

ALTHOUGH it does not appear that the T R A D E S C A N T S contributed materially to amplify what is more especially meant by English Botany, or the discovery and illustration of the plants spontaneously growing in *England*: yet, in a work devoted to the commemoration of Botanists, their name stands too high not to demand an honourable notice; since they contributed, at an early period, by their garden

garden and museum, to raise a curiosity that was eminently useful to the progress and improvement of natural history in general.

John TRADESCANT was by birth a Dutch man, as we are informed by *A. Wood*. On what occasion, and at what period, he came into *England*, is not precisely ascertained. He is said to have been, for a considerable time, in the service of Lord Treasurer SALISBURY and Lord WOOTON. He travelled several years, and into various parts of *Europe*; as far eastward as into *Russia*. He was in a fleet that was sent against the *Algerines* in 1620, and mention is made of his collecting plants in *Barbary*, and in the isles of the Mediterranean. He is said to have brought the *trifolium stellatum* *Lin.* from the isle of *Fermentera*; and his name frequently occurs in the second edition of GERARD by JOHNSON; in PARKINSON'S "Theatre of Plants," and in his "Garden of Flowers," printed in 1656. But I conjecture that TRADESCANT was not resident in *England* in the time of GERARD himself, or known to him.

He appears however to have been established

lished in *England*, and his garden founded at *Lambeth*; about the year 1629 he obtained the title of gardener to *Charles I.* TRADESCANT was a man of extraordinary curiosity, and the first in this country, who made any considerable collection of the subjects of natural history. He had a son of the same name, who took a voyage to *Virginia*, from whence he returned with many new plants. They were the means of introducing a variety of curious species into this kingdom; several of which bore their names—*Tradescant's Spiderwort*, *Tradescant's Aster*, are well known to this day; and LINNÆUS has immortalized them among the Botanists, by making a new genus, under their name, of the *Spiderwort*, which had before been called *Ephemeron*. His Museum, called *Tradescant's Ark*, attracted the curiosity of the age, and was much frequented by the great, by whose means it was also much enlarged, as appears by the list of his benefactors, printed at the end of "his MUSEUM TRADESCANTIANUM;" among whom, after the names of the king and queen, are found those of many of the first nobility.

This small volume, the author entitled
VOL. I. N "MUSEUM

"MUSEUM TRADESCANTIANUM; or, a
"Collection of Rarities preserved at South
"Lambeth, near London. By John TRA-
"DESCANT." 1656, 12°. It contains lists of
his birds, quadrupeds, fish, shells, insects,
minerals, fruits, artificial and miscellaneous
curiosities, war instruments, habits, utensils,
coins, and medals. These are followed by
a catalogue, in English and Latin, of the
plants of his garden, and a list of his be-
nefactors. The reader may see a curious
account of the remains of this garden, drawn
up in the year 1749, by the late Sir
William WATSON, and printed in the 46th
volume of the Philosophical Transactions.
Prefixed to this volume were the prints of
both father and son; which, from the cir-
cumstance of being engraved by HOLLAR,
has rendered the book well known to the
collectors of prints, by whom most of the
copies have been plundered of the impres-
sions.

In what year the elder TRADESCANT
died, is not certain, but his print above-
mentioned represents him as a man ad-
vanced in age.

The son inherited the *museum*, and be-
queathed

queathed it by a deed of gift to Mr. ASHMOLE, who lodged in *Tradescant's* house. It afterwards became part of the *Ashmolean museum*, and the name of TRADESCANT was unjustly sunk in that of *Ashmole*. John, the son, died in 1662. His widow erected a curious monument, in memory of the family, in *Lambeth* church yard, of which a large account, and engravings from a drawing of it in the *Pepysian* library at *Cambridge*, are given by the late learned Dr. DUCARREL, in the 63d volume of the *Philosophical Transactions**.

R. TURNER, CULPEPPER,
and LOVELL.

The influence of Astrology in Physic and Botany, was far from being worn out in the middle of this age. By the credulity and superstition of some, and the dishonesty of others, it still maintained its ground. Se-

* The name TRADESCANTIA was first applied by RUPPIUS, a German, in his *Flora Fenenfis*, to a plant introduced into the English gardens by TRADESCANT himself, and sufficiently known by the appellation of *Tradescant's Spiderwort*, to which genus LINNÆUS has since reduced six other species.

veral physicians, and other men of learning, shewed some bias towards it. Many practitioners of an inferior class, and numerous empirics, were still advocates for astrological influence in the preparation and application of simples.

There is an Herbal written by *Robert TURNER*, who calls himself *Botanologicæ Studiosus*, under the title of “BOTANOLÓGIA, the British Physician; or, The Nature and Vertues of English Plants; exactly describing such as grow naturally in the land, with their several names, Greek, Latin, or English; natures, places where they flourish, and are most proper to be gathered; their degrees of temperature, applications, and vertues, physical and astrological uses treated of, &c.” London, 1664, 12°. But, of the astrological herbalists, *Nicholas CULPEPPER* stands eminently forward. His “Herbal,” first printed in 1652, which continued for more than a century, to be the manual of good ladies in the country, is well known; and, to do the author justice, his descriptions of common plants were drawn up with a clearness

clearness and distinction that would not have disgraced a better pen.

Yet there is one author of this order, whose respectability might exempt him from total oblivion. *Robert LOVELL's* "compleat Herbal," although said to be written by him whilst a young man, is of so singular a complexion, as to merit notice in a work of this kind, were it only to regret the misapplication of talents, which demonstrate an extensive knowledge of books, a wonderful industry in the collection of his materials, and not less judgment in the arrangement. The first edition was printed in 1659; the second in 1665, in 8°. at *Oxford*, pp. 672, exclusive of the introduction of 84 pages, and bears the following title, "PAMBOTANOLOGIA: *five Encb-*
ridion Botanicum; or, A compleat Her-
 bal; containing the sum of antient and
 modern authors, both Galenical and
 Chymical, touching trees, shrubs, plants,
 fruits, flowers, &c. in an alphabetical
 order, wherein all that are not in the
 physic garden in *Oxford* are noted with
 asterisks. Shewing their place, time,

“ names, kinds, temperature, virtues, use,
“ dose, danger, and antidotes ; together
“ with an introduction to herbarisme, &c.
“ an appendix of exotics, and an universal
“ index of plants, shewing what grow wild
“ in *England* ; 2d edition with additions.”
Oxford, 1665, 12°.

To those whose curiosity leans that way, it may not be easy to direct them to a more concise, or more perfectly methodical arrangement of simples, according to the Galenical principles of the four elements, temperaments, and qualities, than may be met with in the introduction to this book.

The arrangement of the matter in the work itself is according to the alphabet of the English names ; to which is subjoined the place of growth, the time of flowering, then the name in Greek, and the Latin officinal term. There are no descriptions of the plants ; but the qualities and uses of each are collected from a profusion of authors, and applied to all the species under each generical term ; the form in which the medicine should be given, the authority for each carefully cited, and the officinal compounds

compounds into which they enter affiduously noticed. The author includes simples, both of exotic and of indigenous growth.

He professes to have cited near two hundred and fifty authors, of which he gives the list. At p. 482 begins an appendix on the drugs of the East and West Indies, extracted from the Arabians, and from HERNANDEZ. A copious index of names to all the plants of his "Herbal," with the synonyms; especially of the older authors; of such as are mentioned in TRADESCANT; BAUHINE's *Pinax*; of those which are in the foreign botanical gardens, and not in that of *Oxford*; and lastly, of those in the PHYTOLOGIA BRITANNICA. The work concludes with a large index of diseases, with the appropriate remedies from the simples of his work. In his catalogue of authors, he gives the number of figures contained in their works, which I transcribe as a matter of curiosity, that cannot fail to gratify the botanical reader*.

PECHEY.

* <i>Apollinaris</i> l. <i>Albertus</i> ,	-	-	141
<i>Alpinus</i> , <i>Prosper</i>	-	-	46
<i>Bauhinu</i> , <i>J.</i>	-	-	3547

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Brunsfelfsus

P E C H E Y.

After the recital of CULPEPPER and LOVELL, I cannot refuse admittance to an author of more respectability, though not deeply skilled in botanical knowledge.

“ The compleat Herbal of Physical
“ Plants ; containing all such *English* and
“ foreign herbs, and shrubs, and trees, as
“ are used in phyfic and surgery. By *John*

<i>Brunsfelsius</i>	-	-	288
<i>Camerarius,</i>	-	-	1003
<i>Clusius, Rariores</i>	-	-	1135
—— <i>Exotica,</i>	-	-	194
<i>Columna,</i>	-	-	205
<i>Cordus,</i>	-	-	272
<i>Dodonæus,</i>	-	-	1305
<i>Durantes,</i>	-	-	879
<i>Eystettensis Hortus</i>	-	-	1083
<i>Fuschsius,</i>	-	-	516
<i>Johnson's Gerard,</i>	-	-	2730
<i>Lobell,</i>	-	-	2116
<i>Lonicerus,</i>	-	-	833
<i>Matthiolus,</i>	-	-	957
<i>Parkinson,</i>	-	-	2786
<i>Rauwolf,</i>	-	-	42
<i>Renealme,</i>	-	-	42
<i>Ruellius,</i>	-	-	350
<i>Tragus,</i>	-	-	567

“ P E C H E Y,

“PECHEY, M. D. fellow of the college of
“physicians.” 8°. 1694; reprinted at *Am-*
sterdam the same year, and in 1707. The
descriptions, which are short, are taken
from RAY’s history; the virtues from a
variety of authors. The natural places of
growth of the English plants are specified;
but the author betrays his want of botani-
cal knowledge, by enumerating several in-
digenous as exotic plants. PECHEY was
the first who introduced into use the *casu-*
munar; of which he is said to have made a
secret, and considered it as a corrector of the
Peruvian bark.

In the same year was published, “PHI-
LOBOTANOLOGIA: s. *Historia Vegetabilium*
facra; or, A Scriptural Herbal. By William
WESTMACOTT.” 8°. 1694. Not having
seen this volume I can give no further ac-
count of it.

S A L M O N.

If my readers will excuse the anachronism,
I am here tempted to anticipate the name
of an author, the complexion of whose
writings

writings renders it not improper to notice him after CULPEPPER and LOVELL; although in the time he lived, the influence of astrology had lost still more of its power. To the fastidious critic in Botany, it might need some apology, that I introduce into these anecdotes the name of SALMON; well known as a multifarious writer, and author of numerous publications in physic, all of the empirical cast. I confess, however, I could not pass over, in total silence, a writer to whom, although no praise can be due as a botanist, yet the commendation of industry ought not to be withheld from a man who could bestow twenty years labour, in the compilation of "an Herbal" of 1296 pages, in folio. I will recite the title, which will sufficiently shew the nature of his work.

"The ENGLISH HERBAL; or, History of Plants; containing, 1. Their names, *Greek, Latin, and English.* 2. Species, or various kinds. 3. Descriptions. 4. Places of growth. 5. Times of flowering and seeding. 6. Qualities or properties. 7. Their specifications. 8. Preparations, Galenic and Chymical. 9. Virtues

“ 9. Virtues and uses. 10. A compleat
“ *florilegium* of all the choice flowers culti-
“ vated by our florists, interspersed through
“ the work, in their proper places, where
“ you have their culture, choice, increase,
“ and way of management, as well for pro-
“ fit as delectation, adorned with exquisite
“ icons, or figures of the most considerable
“ species. By *William SALMON*, M. D.”
London, fol. 2 vol. 1711.

The order of SALMON's book is alphabetical, and, as it is a work of mere compilation, he professes to have consulted all the botanical authors of repute, and enumerates the names of such. His design was to treat on medicinal herbs principally. As a botanical work it is beneath all criticism; the errors in this way being enormous, both in multitude and degree. In detailing the powers of simples, he follows the Galenic terms of expression used by the writers of the preceding century, and distributes, with a lavish hand, extraordinary and numerous powers to almost every herb he describes. Exclusive of his industry, some merit is due to SALMON for the regular arrangement of
his

his subjects, subordinate to his method; qualities which, under the direction of more skill in Botany, and a sounder judgment in discriminating the properties of simples, might have enabled him to have executed more effectually what seems to have been his purpose, that of superseding the Herbals of GERARD and PARKINSON, in which he totally failed. His tables, I have noticed heretofore, in speaking on wooden cuts. But from these authors I return to writers of dignity and importance; and, with peculiar satisfaction, to the view, especially, of a character, from whose penetrating genius, and persevering industry, not Botany alone, but Zoology, may date a new æra. On this occasion I singularly lament, that I am not furnished with any new materials to illustrate the life of RAY; of whom it may with truth be maintained, that in these branches of natural history, he became, without the patronage of an *Alexander*, the *Aristotle* of England, and the *Linnaeus* of the time.

C H A P. 15.

Retrospective view of botanical science in the period immediately antecedent to Ray—A detailed account of the life and writings of Ray—His Catalogus Cantabrigiensis—Ray's three first botanical tours—Appendixes to the Cambridge Catalogue—Foreign travels—Fourth tour in England—Elected fellow of the Royal Society.

R A Y.

IF we here take a retrospective view of the progress of botany during the first period of the seventeenth century, we find that, however particular individuals, both in *England* and on the continent, might have laboured in its advancement, it was not, on the whole, in a flourishing state, either here, or in any other part of *Europe*. From the time of the *BAUHINES*, even to that of *RAY*, its progress as a science was slow. The Remains of *John BAUHINE*, his "*Historia Plantarum Universalis*," printed in 1650, in three large folio

folio volumes, at the expence of 40,000 florins, defrayed by F. L. à *Graffenreid*, was the principal performance on the continent, and that indeed was invaluable. It is a monument of learning and industry, of which few examples can be expected in any one age. That which *GESNER* performed for zoology, *John BAUHINE* effected in botany. It is, in reality, a repository of all that was valuable in the ancients, in his immediate predecessors, and in the discoveries of his own time, relating to the history of vegetables, and is executed with that accuracy and critical judgment which can only be exhibited by superior talents.

The obstacles to the improvement of botany were various. *Europe* had been involved in war, the perpetual enemy to free intercourse among the learned; and to commerce, which is ever friendly to natural science. Simples were neglected in physic, for medicines drawn from chymistry. Even alchymy yet employed the industry of many in every nation of *Europe*. Botanical gardens, although several, both public and private, had been established, did not, however, flourish.

flourish. The *Indies* had not yet poured in their treasures with that liberal hand which was soon after experienced. Even the passion of the florist for varieties assisted in depressing the genuine spirit of the botanist. But the time was now approaching, when botany was about to receive a capital advantage and embellishment, by the introduction and establishment of *system*; of the rise and progress of which, it will not be incongruous to my plan to give a short account, since this great revolution formed a new æra in the history of the science. As the revival of it, however, did not take place till the time of Mr. RAY and Dr. MORISON, I will postpone what I have to say on this subject, till I have given some account of the writings of those justly celebrated naturalists, by whose labours system itself was restored and improved.

The earliest anecdotes of Mr. RAY, to which I can refer, are some brief outlines of his life, in the "Compleat History of Europe for the year 1705." A more connected account of this learned and excellent man may be seen in the "General Dictionary,"

nary," and the "Biographia Britannica;" but the most detailed relation is that of Dr. SCOTT, published in 1760, from materials collected by Dr. DERHAM. This is well abridged in the *Biographical Dictionary*. It is much to be regretted, that our curiosity has not been more amply gratified than by these short and imperfect memoirs.

A more circumstantial narrative of the life of Mr. RAY would, even at this distance of time, be a valuable accession to biography, and highly grateful to those, who are sensible of the great improvements which he gave to the science of natural history in general; nor could sufficient justice be done to his manifold talents, discoveries, and writings, but by a pen of the first eminence in biographical literature.

The limits of my plan will not allow of more than a general detail of the principal events of his life, as connected in chronological order with his writings.

John Wray, or, as he always spelt his name after the year 1669, RAY, was born at *Black Notley*, near *Braintree*, in *Essex*, Nov. 29,

1628.

1628. His father, though in so humble a situation as that of a blacksmith, sent his son to the grammar-school at *Braintree*; and in 1644, entered him at Catherine Hall, in *Cambridge*; from whence he removed, in less than two years, to Trinity College, where the politer sciences were more cultivated. Dr. BARROW was his fellow pupil, and intimate friend, and, on account of their early proficiencies, both were the favourites of their learned tutor, Dr. DUPORT. He was chosen minor-fellow of Trinity, in 1649; in 1651, was made Greek lecturer of the college; in 1653, mathematical lecturer; and in 1655, humanity reader. These appointments were sufficient testimonies of his talents and abilities at this early period. He afterwards passed through the offices of the college, and became tutor to many gentlemen of honourable birth and attainments, who gave him due praise and acknowledgments for his watchful care of them. He also distinguished himself, while in college, as a sensible and rational preacher, and a sound divine. As his favourite study was the

works of God, he laid, at this time, in his college lectures, the foundation of his "Wisdom of God in the Creation," and of his "Three Physico-theological Discourses;" which were afterwards so well received by the public.

At the period when Mr. RAY turned his attention to the study of nature, the knowledge of plants was not highly superior to the state in which TURNER had found it, in the same place, more than a century before. In this study RAY could find no master. I am not able to say, that a single publication, of a scientific nature, on the subject of plants, had ever appeared at *Cambridge*; for *Maplet's* "Green Forest" will scarcely be thought worthy of that appellation. *Oxford* had, indeed, not only experienced the benefit of private encouragement, but of public munificence, in the establishment of a Garden. But at the sister university Mr. RAY stood alone, himself indeed an host! Self-taught as he was, and full of ardour, he so forcibly displayed the utility of botanical knowledge, and its intimate connection with the arts, and conveniences

niences of life, independent even of those charms, which the views of nature ever afford to contemplative minds, that he soon made it an object of attention ; and numbered among his associates in these studies, Mr. NID, a senior fellow of his own college, Mr. *Francis WILLUGHBY*, and Mr. *Peter COURTHOPE*. The first of these gentlemen became his inseparable companion ; but he had the misfortune to deplore his death, a little time before the publication of his first work, which came out under the title of “ *CATALOGUS PLANTARUM CIRCA CANTABRIGIAM NASCENTIUM.*” *Cantab.* 1660.” pp. 182. *cum Indicibus,* &c. pp. 103. 12°.

This little volume contains all the plants which the author had observed spontaneously growing in the neighbourhood of *Cambridge*, amounting to 626, all varieties and dubious plants excluded. The number is small, when compared with many modern catalogues ; but not so, when it is recollected, that, at that period, a very few of the *Cryptogamia* class, and not many of

the *Graminaceous* tribe, had been investigated.

The plants are disposed in the alphabetical order of the *Latin* names; and the synonyms of the four principal authors then in use given at length. These are GERARD and PARKINSON, and the two BAUHINES; nor are others wanting, when characteristic of the plant. Prefixed is a list of the authors, so accurately and instructively drawn up, as not to have lost its utility to this day. Mr. RAY has interspersed many select observations, on the medicinal and æconomical uses of the plants; on the structure of the flower; on varieties: and has not only described some new plants, discovered by himself, but given accurate distinctions of many, before imperfectly known. Subjoined, the reader finds an index of the *English* names, preceding the *Latin*; an index, specifying the particular places of the more rare plants; then, a copious etymology of the names, and an explanation of the terms used in the science. In fine, he has done every thing to facilitate the labour
of

of the student in this part, as in the former to instruct and entertain the more erudite reader.

I have been the more diffuse on this small volume, as the author has observed nearly the same plan, in his subsequent catalogues, and SYNOPSIS. *Moles parva, Vis magna.* When the time in which this publication was made, and the meagre structure of preceding catalogues is considered, I may safely appeal to modern judges, whether this was not an extraordinary production. Few local catalogues had been published at home; and, I believe, not one abroad, that displayed any thing like a comparable share of science and erudition, so aptly united.

Among the variety of notes in this catalogue, there is one, possibly not of public notoriety. Mr. RAY informs us, that the people of *Norwich* had long excelled in the culture and production of fine flowers; and that in those days, the florists held their annual feasts, and crowned the best flower with a premium, as at present.

There can be no doubt that this volume met with the most favourable reception

from the learned in this way ; that it promoted the study of plants ; and, by raising the reputation of its author, encouraged him to prosecute his studies with vigour.

These occupations, however, did not divert Mr. RAY from his object of entering into the ministry. He was, in Dec. 1660, ordained both deacon and priest, by Dr. *Sanderfon*, bishop of *Lincoln*, and continued fellow of *Trinity College* till the Bartholomew act; which, as he did not subscribe, necessarily superseded him. This event took place Sept. 18, 1662.

The desire Mr. RAY had to extend his knowledge of *English* botany, had induced him, in the autumn of 1658, to take a journey, which he performed alone, through the midland counties of *England*, and the northern part of *Wales*, in search of plants. This tour held him from August 9, to September 18. Of this, and of two other tours, Mr. RAY preserved some short memorandums, in which he has noticed his daily progress, some remarkable facts that occurred, some observations on the antiquities that he met with, and some of the rare plants.

plants. Dr. SCOTT has published these *Itineraries*, with his life.

In his subsequent journies, he was commonly accompanied by some friends of a congenial taste ; thus, in his second tour, in the autumn of 1661, Mr. WILLUGHBY, and some other gentlemen, travelled with Mr. RAY into *Scotland*, through the counties of *Durham* and *Northumberland*, to *Edinburgh*, *Glasgow*, and back through *Cumberland* and *Westmorland*. This journey held six weeks, from July 26, to August 30. In 1662, Mr. RAY, accompanied by Mr. WILLUGHBY, took his third and most extensive *English* tour ; through the middle counties of *England*, into *Cheshire* ; thence into *North Wales*, and through the middle *Welsh* counties, into *Pembrokeshire*, coasting the southern part, to *Bath* and *Bristol* ; thence to the *Land's End*, through *Somerset* and *Devon* ; returning through *Dorsetshire*, *Wiltshire*, and *Hampshire*. They were absent in this excursion, from May 8, to July 18 ; and Mr. RAY gathered a plentiful harvest, which afterwards enabled him to enrich his general “ *Catalogue of English Plants*,”

then in meditation; nor did he omit to avail himself of every opportunity, particularly at *Tenby*, in *Wales*, and in *Cornwall*, of describing such birds and fishes as were less frequent in other parts, preparatory to his intended publications in the zoological way.

In 1663 he published an *Appendix* to the "Cambridge Catalogue," containing emendations, and the addition of forty-two plants. And in 1685, came out another *Appendix*, with the addition of sixty more, not noticed before; which were principally communicated by Mr. DENT, of *Cambridge*. These little tracts are become very scarce. Those who are curious to see what these additional plants were, may find them distinguished from the others in Professor MARTYN's "*Plantæ Cantabrigienses*."

Being now at liberty from the constraints and business of a college life, he was led to accompany Mr. WILLUGHBY, Mr. SKIP-PON, and Mr. Nathaniel BACON, two of them his pupils, to the continent. Mr. RAY was absent from April 18, 1663, to March 1665-6; during which time, they
visited

visited *France, Holland, Germany, Switzerland, Italy*; and extended their journey to *Sicily* and to *Malta*. The fruit of this expedition will afterwards appear.

On his return from the continent, he spent the summer of 1666 between his friends in *Essex* and *Sussex*, and in reading the publications which had appeared in *England* during the three years of his absence. The winter passed in reviewing and arranging the museum of his friend and pupil, Mr. WILLUGHBY, rich in animal and fossil productions; in arranging his own catalogues for his general list of *English* vegetables; and in framing the tables for Dr. WILKINS's "Real, or Universal Character."

In the summer of 1667, Mr. RAY, accompanied by his much-honoured friend, Mr. WILLUGHBY, made his fourth excursion into the distant counties. They left *Middleton Park* on June 25, and took their route to the *Land's End*, through the counties of *Worcester, Gloucester, and Somerset*; and returned through *Hants* to *London* on September 13. In this journey, besides the
pointed

pointed objects of their pursuit, they took notes on the mines, and smelting, and on the method of making salt; and Mr. RAY did not omit to make, as he had done before, ample additions for his collections of proverbs and of local *English* words.

On Nov. 7, of this year, he was chosen fellow of the Royal Society, and was prevailed on by Bishop WILKINS to translate his "Real Character" into *Latin*. This he performed, though it was never published; and the manuscript is extant in the library of the Royal Society. The latter end of the year, and the beginning of 1668, he spent with gentlemen who had all been his pupils at Trinity; Mr. BURREL, and Mr. COURTHOPE, at *Danny*, in *Suffex*; Sir Robert BARNHAM, at *Bocton*, in *Kent*; and with Mr. WILLUGHBY, in *Warwickshire*. In the autumn of this year, he took his fifth journey, alone, into *Yorkshire* and *Westmorland*, returning in September to *Middleton Hall*; and spent the winter with Mr. WILLUGHBY, then lately married.

C H A P. 16.

Account of Ray continued—Makes experiments on the motion of the sap—Catalogus Plantarum Angliæ—Sixth tour in England—Decease of his friend Mr. Willughby—and of Bp. Wilkins—Nomenclator Classicus — His marriage — His Observations topographical and moral, &c. made in his foreign travels : with the Catalogus Stirpium Exoticarum, annexed.

R A Y.

ABOUT this time Dr. TONGE, Dr. BEAL, and some other philosophical gentlemen, in *England*, were busied in experiments relating to the motion of the sap in trees. Among these also, in the spring of 1669, Mr. RAY and Mr. WILLUGHBY entered upon a set of the like experiments, and induced Mr. (afterwards Dr.) LISTER, to prosecute the same. These experiments were made on the birch, the sycamore or greater maple, the alder, the ash, the hasel, chesnut, walnut, and willow ; of which the two first
were

were found to be the best adapted to the purpose, from their bleeding most freely.

The experiments of Mr. RAY and Mr. WILLUGHBY, which were printed in the fourth volume of the *Philosophical Transactions*, proved the ascent and descent, as well as the lateral course, of the sap; but these gentlemen declined giving any decisive opinion, as to a real circulation upwards by the vessels of the wood, and downwards by those between the wood and the bark; which was the doctrine maintained soon after this time by GREW and MALPHIGI, and indeed afterwards adopted by Mr. RAY himself.

This doctrine of the circulation of the sap, I need scarcely remark, gave way to the experiments of Dr. HALES and others; which teaches, that the sap rises and falls, in the same system of vessels, as it is affected by the joint operations of air and warmth. Yet there have not been wanting ingenious men of late years, also, who, conceiving the analogy between animals and vegetables to be greater than is usually imagined, and even that plants not only live, but feel, have
advanced

advanced it as still probable, that there is a real circulation of the juices; the *succus communis* rising from the roots, and the *succus proprius* descending towards them. Whether these physiologies will yield to the *prolepsis plantarum* of the LINNÆAN school, time must evince.

When Mr. RAY was at *Chester*, in 1669, he availed himself of an opportunity of viewing a young porpoise, and of attending the dissection of it. Of the anatomical structure of this animal, he communicated a circumstantial account to the R. S. in 1671; and it was printed in the *Philosophical Transactions*, N° 74 and 76.

In 1671, Mr. RAY wrote a paper, printed in the *Philosophical Transactions*, N° 74, on the subject of "Spontaneous Generation," a point of philosophy which had been much discussed, and to which some among the learned were yet attached. It appears from this paper, that he very early rejected this doctrine, and was confirmed in his opinion by the experiments of REDI.

We are now to reap the fruit of Mr. RAY's repeated journies into the various
parts

parts of *England*, taken with a professed view, to ascertain the *loci natales* of all the native plants, more accurately than had yet been done; to investigate the more rare, and perchance to discover new ones. In each of these departments he had proved successful, and in this year drew up his "Catalogue," and dedicated it to his friend and Mæcenæ Mr. WILLUGHBY, under the following title, "*CATALOGUS PLANTARUM ANGLIÆ et insularum adjacentium tum indigenas tum in agris passim cultas complectens.*" Lond. 1670, pp. 358. 8°.

This work is modelled after the *Cambridge Catalogue* in general, as to the order of the subject, except that the author has been much more sparing of the synonyms, from all authors but the four classical writers, GERARD, PARKINSON, and the two BAUHINES. Several new plants are described in this volume, and many doubtful ones discriminated, with that critical accuracy which so singularly marked his pen, and which had not before been seen in any *English* writer.

Hitherto the *cryptogamous* and *gramina-*
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ceous tribe, had engaged but little attention ; and in this volume, these classes do not far exceed the number registered in the *Cambridge Catalogue*. The whole number of plants in this list, amount to about 1050 only. This small number had been owing to the extreme caution of Mr. RAY, not to admit any varieties to hold the place of species ; and to exclude all others on doubtful authority. How, in his "*Phytologia*," has upwards of 1200 ; and MERRETT, in his "*Pinax*," upwards of 1400 ; certain proofs that the authors had not sufficiently studied the nicer distinctions, which guided the judgment of Mr. RAY ; and as a proof, it may be observed, that many of their plants are to this day undiscovered. Sensible as Mr. RAY was of the errors of MERRETT'S "*Pinax*," he purposely omitted quoting it, as he writes to Dr. LISTER, that he might avoid that censure of it, which could not properly have been withheld, had he given his impartial opinion of that performance.

In this year, he informs Dr. LISTER, that he had, what he thought, a most liberal offer, of one hundred pounds a year, and
all

all his expences defrayed, to accompany three young gentlemen abroad. But he declined it, although he much wished to have taken a review of the alpine plants. Indisposition had some share in this refusal, and we find that in the next spring, 1671, he suffered much from a jaundice. He was so far recovered, however, before *July*, as to be able to set off on his sixth journey, in which he took with him *Thomas WILLISEL*, an unlettered man, but one, whose love for plants, and his zeal and assiduity in collecting them, merits commemoration. They travelled through *Derbyshire, Yorkshire*, and all the northern counties, as far as to *Berwick*, and back through the bishoprick of *Durham*.

In the same year died, to the unspeakable loss and grief of Mr. RAY, his most valuable friend *Francis WILLUGHBY*, Esq; on *July 3d*, in the 37th year of his age. The strictest intimacy had subsisted between them, from the time of their being fellow collegians ; and it was cemented by a congeniality of taste, which not unfrequently forms a stronger bond of union, than the
ties

tics of blood. Mr. WILLUGHBY had imbibed, very early, a strong taste for the study of the animal kingdom, and had made extraordinary collections for completing the "History of Birds and Fishes;" in which he had ever been assisted by his friend Mr. RAY; who experienced his high attachment and confidence, in being left one of his executors, and charged with the education of his two sons, the eldest of whom, was not four years of age. To this care he liberally annexed an annuity of sixty pounds per annum for life, which was ever regularly paid.

Immediately after this melancholy event, he desisted from journeying again into the western counties, as he had intended; and refused an invitation from Dr. LISTER, to live with him at York; in order to give himself up to the faithful discharge of his trust.

For the use of these young gentlemen, Mr. RAY drew up, in 1672, his *Nomenclator Classicus*, induced thereto by observing the multitude of errors in the names of plants and animals, in the manuals of daily use. This compilation had authority

enough to recommend itself to subsequent writers of dictionaries and lexicons, and has been reprinted several times.

On *November* 19th, 1672, he sustained, in the death of Bishop WILKINS, the loss of another of his best friends. For this candid, ingenious, and learned man, he had a sincere esteem and veneration.

In the lot of human life, such chasms are not easily filled up after the age of forty-five. It is however not unreasonable to conjecture, that these privations added strength to his motives for domestic retirement, and accelerated at least, that connexion he made the next year, when he married Margaret the daughter of Mr. *John Oakely*, of *Launton*, in *Oxfordshire*. They were married in the church of *Middleton*, on *June* the 5th, 1673.

In the same year Mr. RAY gave to the public the fruit of his foreign travels, under the title of, "Observations, topographical, " moral, and physiological, made in a journey through part of the Low Countries, " *Germany, Italy, and France.*" *London*, 1673. 8°. pp. 499.

The great object of accompanying his
three

three associates in this tour, was, the enlargement of his knowledge in natural history, and particularly in the vegetable kingdom; and the great number of plants observed and collected by him, exceeded, as he informs us, his expectation: not that any opportunities escaped him of describing the birds and fishes of the several countries they passed through, in aid of Mr. WIL-
LUGHBY's plans. His notes concerning those of *Germany*, were unfortunately lost. The volume before us, however, is by no means confined to natural history. Mr. RAY treats on the manners of the people, and expatiates often on the excellencies and defects of the several governments, particularly of the cities on the continent, and on the state of the academies and universities. He does not omit to notice the antiquities that occurred and of those at *Rome*, he gives a very methodical account. Besides many miscellaneous remarks on various other parts of natural history, he has taken occasion to make a digression, which, at that time, must have been of a very interesting nature, on the most remarkable places,

where petrified shells and figured fossils are found, both in *England* and elsewhere ; and on the various opinions of authors, relating to the origin of these bodies. He freely declares his sentiments, that they are the remains of once-organized bodies, in opposition to those who imagined them to be the product of what they called a *plastic* power. He afterwards confirms his positions, by additional arguments recited in a letter to Dr. ROBINSON. See *Letters*, p. 165.

In the course of their journey, he every where notices those plants that are not natives of *England*, and gives copious catalogues of them. They spent in the whole, six months at *Geneva*, which gave Mr. RAY an opportunity of informing himself largely, relating to the plants of *Switzerland*, particularly those of Mount *Salève*, the *Dole*, and of Mount *Jura*. He even discovered some that were unknown to the preceding botanists, although these were the regions of GESNER, and the BAUHINÉS.

The celebrated HALLER, even ranks him

him among those who made large accessions to the Botany of that country, and gives the strongest testimony of his skill, fidelity, and judgment, in discriminating, describing, and extricating the plants of that fruitful region.

To the end of these "Observations," is affixed an alphabetical list of the plants mentioned in the body of the book, under the title of "CATALOGUS STIRPIUM IN EXTERIS REGIONIBUS, à nobis observatarum, quæ vel omnino vel parçè admodum in Anglia sponte proveniunt." pp. 115.

In the arrangement he cites the same authors for synonyms as in his preceding catalogues, and occasionally introduces observations on the qualities and uses.

C H A P. 17.

Account of Mr. Ray continued—His various erudition—Collection of English Proverbs—Collection of English Words—Second edition of the Catalogus Plantarum Angliæ—Publishes Willughby's Ornithology, both in Latin, and in English—Engaged by the R. S. to make experiments in natural history—Removal to Black Notley, in Essex—Publishes Willughby's Ichthyology.

R A Y.

THE talents of Mr. RAY were not confined to natural history. He had a relish, among other departments of literature, for philological enquiries, and the genius of the *English* language had engaged much of his attention. Of his pursuits in this way, he has left memorials, which have extended his reputation beyond the sphere of natural history, and made him known to the learned world in general.

I refer to his “Collection of *English* Proverbs,” and to his “Collection of

“ *English Words.*” The foundation of these publications was laid in his various tours through the different parts of *England*. His “ *Proverbs*” were finished for the press in 1669, but not published till 1672, and a second edition, much enlarged, in 1678, under the following title: “ A COLLECTION OF ENGLISH PROVERBS, digested into a convenient method for the speedy finding one upon occasion; with short annotations. Whereunto are added local proverbs, with their explications, old proverbial rhymes, less known, or exotic proverbial sentences and *Scottish* proverbs. Enlarged by the addition of many hundred *English*, and an appendix of *Hew* proverbs, with annotations and parallels.” *Cambridge*. 8°. pp. 414.

It has been reprinted many times, and, I think, so lately as in the year 1768.

To collect these sententious maxims of knowledge, both of a moral, prudential, and even a jocular nature, has not been deemed unworthy employment, by men of eminent learning and intelligence. The *Adagies* of ERASMUS furnish a sufficient

example of the estimation he gave them. They were an oral and traditionary kind of didactics, which bore a greater value before the diffusion of knowledge by the use of printing; and, in oriental countries, are still a favourite and usual mode of instruction.

Of such as have been handed down in *Britain*, from father to son, through numerous generations, Mr. RAY's collection contains an ample store. It is, I believe, the principal in its way; and the author has interspersed many notes, which illustrate the origin and sense of these aphoristic lessons, and throw no small light on the manners and customs of various people.

In 1674, was published, his "COLLECTION OF ENGLISH WORDS not generally used, with their significations, and original, in two alphabetical catalogues, one of the northern, and the other of the southern counties. To which is added, an account of the preparing and refining such metals and minerals as are gotten in *England*." *London*, 12°.

This little volume is dedicated to his friend Mr. COURTHOPE, at whose suggestion,

tion, he tells us, it was undertaken, and who contributed largely to augment it. In the first edition was a catalogue of the *English* birds and fishes; but this was omitted in a subsequent improved and enlarged edition, in 1691, Mr. RAY having then projected his "*Synopsis Animalium*."

This is one of those philological collections, which tends to amuse and gratify general curiosity, is of use, not only to strangers and those who travel, but to those who stay much at home; while it contributes to enlarge the extent, and illustrate the construction of the *English* tongue. Mr. *Thoresby*, of *Leeds*, sent to Mr. Ray, a large addition to this list in the year 1703, which was printed in his "Philosophical Letters," by Dr. *Derham*.

In 1675, he communicated to the *Royal Society* some experiments, made, I believe, by Mr. WILLUGHBY, accompanied with his own observations, tending to ascertain the true use of the *air-bladder* in fishes. They are such as the present physiology of fishes have confirmed; and were printed in the *Philosophical Transactions*, N° 115.

In

In the year 1677, his “ Catalogue of “ *English plants*” being out of print, he gave another edition, augmented with new observations, and the addition of 30 species of the more perfect plants, and 16 *funguses*; several of these were new discoveries. He herealso gives the figures of the *pentapbylloides fruticosa*, (*potentilla fruticosa* Lin.) and the *fungus phalloides* (*phallus impudicus* Lin.)

Mr. RAY continued, after his marriage, to reside at *Middleton Hall*, where his engagements at this period of his life, were such as called forth all the talents of his literary abilities, and demanded all his care as a faithful guardian. He was employed in a double duty, that of his trust to the sons of his late estimable friend, and of editor to the remains of their father, “ On the History of Birds and Fishes.” The *Ornithology* was first published, to which, as it consisted of loose papers, written in *Latin*, and in an undigested state, Mr. RAY gave method, and supplied, from his own observations, a large share of valuable materials. It was published under the following title :
 “ ORNITHOLOGIÆ LIBRI TRES: *in quibus,*
Aves

Aves omnes hætenus cognitæ, in methodum naturis suis convenientem redactæ accuratè describuntur. Iconibus elegantissimis et vivarum avium simillimis æri incisis illustrantur. Totum opus recognovit, digessit, supplevit Johannes RAIUS." Lond. 1676, fol. pp. 307, t. 77, f. 353.

Mr. RAY translated this work into *English*, and published it, with large additions, in 1678, with figures engraved at the expence of Mrs. WILLUGHBY. The execution of the figures was wholly inadequate to the merit of the work. These occupations, however, did not prevent him from renewing a correspondence with Mr. OLDENBURGH, secretary of the Royal Society, a learned German, who, after having resided some time at *Oxford*, had been chosen into that office at the first establishment of the society. Mr. RAY, in the year 1674, was induced to engage, at the request of the society, with other distant members, to furnish observations on the subjects of natural history, to be read at their meetings; the society notwithstanding the extreme diligence of the secretary, and some few others,

others, being, at this juncture, rather in a languishing state.

On this occasion he wrote several papers, of which some were afterwards printed in the *Philosophical Transactions*. Among those, which were not published, as we find by his letters, were the following. “ On the Acid of Ants : On a Fossil of the figured Kind, found in *Malta*, and known by the name of *St. Paul’s Bassoons Letters*, p. 120 : On the *Trochites* : On Mushrooms : On the Darting of Spiders : On the Seeds of Plants ; and on the specific Differences of Plants.”

On the death of the mother of his friend, the Dowager Lady WILLUGHBY, and the removal of his sons from under Mr. RAY’s tuition, he retired, some time in the year 1676, to *Sutton Cofield*, about four miles distant from *Middleton Hall*, where he remained till Michaelmas 1677. He then made a second removal to *Falkborne Hall*, near *Black Notley* ; at which last place he built a house, and finally settled June 24, 1679.

Mr. WILLUGHBY’s *Icthyology* remaining yet

yet unpublished, Mr. RAY, in 1684, arranged the materials, which had been left in a very imperfect and indigested state. Perhaps no one but Mr. RAY could have fulfilled this posthumous office; certainly no man so effectually, since Mr. RAY had not only himself entirely furnished Mr. WILLUGHBY with many, but even the remainder had chiefly been collected during their almost daily intercourse, and whilst travelling together.

He wrote the two first books himself; revised, methodised, and enlarged the whole; and sent it to the Royal Society; the members of which contributed to furnish the plates; and, by the assistance of Bishop FELL, it was printed at *Oxford*; the Royal Society being at the whole expence. It came out under the following title:

“*Francisci WILLOUGHBEII, Armig. De HISTORIA PISCIIUM, LIBRI quatuor, jussu et sumptu S. RAY. Lond. editi. Totum opus recognovit, coaptavit, supplevit, librum etiam primum et secundum integros adjecit J. RAIUS.*”
Oxon. 1686. fol. pp. 343.

C H A P. 18.

Account of Mr. Ray continued—Meditates the writing of his General History of Plants—Methodus Plantarum, as introductory to that work—Two first volumes of the History, in which are described near seven thousand plants—Fasciculus Stirpium—First edition of the Synopsis Stirpium Britannicarum.

R A Y.

MR. RAY being settled at *Black Notley*, and delivered from that anxiety which had attended him since Mr. WIL-
LUGHBY's death, resumed with great vigour his wonted study of plants; and, having already acquired a reputation that justified any expectation his friends might have formed, he, in compliance with their wishes, attached himself seriously to write "A General History of Plants."

Preparatory to this great work, which he intended to arrange systematically, he put forth, in 1682, his "*METHODUS PLANTARUM*," enlarged, and improved, from the
synoptical

synoptical tables, which he had printed in Bishop WILKINS's "Real Character," in 1668. It bears the following title :

"METHODUS PLANTARUM NOVA brevitat^{is} et perspicuitatis causâ synoptice in tabulis exhibita : cum notis Generum tum summorum tum subalternorum characteristicis. Observationibus nonnullis de seminibus Plantarum et indice copioso." Lond. 1682. 8°. pp. 166.

LINNÆUS, on what authority I know not, mentions an edition of this work, with the date of 1665, totally separate from that of 1682 ; but as that is earlier than Bishop WILKINS's Table, it is probably a mistake.

The first principle of Mr. RAY, in this work, is to preserve all plants together, as far as possible, in the natural characters, arising from conformity in the fructification, and in the general habit. Hence arose, with him, in common as with others, too great a neglect of the flower, and too much attention to the leaves. He adheres to the ancient division of the vegetable kingdom, into trees, shrubs, and herbaceous plants ;
ranking,

ranking, however, with the latter, such as had been called *Suffrutices*, or shrubby. *Trees* he divides into nine classes, accounting the last anomalous; *Sbrubs* into six; and *Herbs* into forty-seven.

In the progress of his improvements afterwards, he reduced these classes to thirty-three. His method, which is indeed extremely elaborate, will best be seen by a view of the classes. It will, however, be but justice to refer the account to the last edition, that it may appear in the greatest perfection which he gave it.

To this book Mr. RAY has subjoined a clear, concise view, and a synoptical table, of the system of CÆSALPINE, and gives his reasons for not adopting it; although he candidly confesses his obligations to the author, whom he acknowledges to be the parent of system.

In 1683 and 1684, Mr. RAY and Dr. Tancred ROBINSON exchanged several letters, while the latter was on a foreign tour, relating to various undetermined facts in natural history; among which, it had been difficult to settle the exact species of the
Macruse,

Macruse, a bird allowed by the Roman Catholics to be eaten in Lent. Their observations relating to this particular were published in the *Phil. Transf.* for 1685, in No. 172. It proved to be the *Scoter*, or *Anas nigra Linnæi*.

We are now come to that performance, which LINNÆUS and HALLER so justly stile *Opus immensi laboris*; and which, considered as the work of one man, has perhaps been exceeded by none, unless indeed by that of *John BAUHINE*, who, however, did not live to put the finishing hand to his labour.

Mr. RAY informs us, that it was at the persuasion of his friend, Mr. WILLUGHBY, that he began to collect materials, with a view to a General History of Plants. But that, after the loss of his friend in 1672, he relaxed; and, on hearing that Dr. MORISON was employed on a similar design, from which considerable expectations were formed, at length gave up his purpose. On the decease of Dr. MORISON in 1683, who left the much greater part of his work unfinished, by the persuasion of his friends,

and particularly of Mr. HORTON, to whom it was dedicated, he resumed his design, and prosecuted the work with vigour. We cannot sufficiently admire the wonderful assiduity and address of this great man, which enabled him, in four years, to collect such a stock of matter, as to furnish two folio volumes, of near one thousand pages each. It even does not appear that he had the assistance of an amanuensis in this labour; which he effected, however, with a skill and judgment that gained him the applause of all succeeding masters in the science.

This important undertaking was intended by the author to comprehend the whole botany of the age, by describing separately, and reducing to his own system, all the plants of the BAUHINES, and of those who had enlarged the stock by subsequent discoveries. These, at the publication of RAY's first volume, were, the plants of *Mexico*, from HERNANDEZ; those of *Brazil*, from PISO and MARCGRAVE; and of the *East Indies*, from BONTIUS. The rare plants of *Italy*, from ZANONI; the new plants of MORISON, BREYNIUS, and MENTZEL.

The

The *Sicilian* plants of **BOCCONE**; but above all, the vast treasure of the six first volumes of the **HORTUS MALABARICUS**; with many from works of lesser note.

After prefixing an instructive list of the writings of near an hundred botanical authors, quoted by him in the body of the book, and giving an explanation of terms, there follows a very comprehensive account of the philosophy of vegetables; in which the anatomy and physiology of plants, from **MALPHIGI**, from **GREW**, and from his own experiments; the differences of the parts of vegetables, from **JUNGIUS** and others, are explained and illustrated, with that judgment and knowledge of the subject, and with that conciseness and methodical accuracy, which, I believe, had rarely, if ever, been equalled by preceding writers. This has rendered the introduction to his History, a choice compendium of all that was valuable in the science of his day; nor is the information it conveys so far superseded by any subsequent discoveries, as to render it, even now, an uninteresting tract. It is not easy to refer the modern student to a

more perfect view of the state of this science near the close of the last century, than will here be found; while the work itself exhibits the great improvement it had received, since the beginning of the same period, and to which the author had himself contributed in an eminent degree.

The first volume was published in the year 1686, under the following title: "*HISTORIA PLANTARUM GENERALIS: species hætenus editas aliasque insuper multas noviter inventas et descriptas complectens; in qua agitur primò de plantis in genere, earumque partibus, accidentibus, et differentiis; deinde genera omnia tum summa tum subalterna ad species usque infimas, notis suis certis et characteristicis definita, methodo naturæ vestigiis insistente disponuntur; species singulæ accuratæ describuntur, obscura illustrantur, ommissa suppleatur superflua resecantur, synonyma necessaria adjiciuntur: vires denique et usus recepti compendio traduntur. Accesserunt Lexicon Botanicum, et Nomenclator Botanicus, cum indicibus necessariis nominum morborum et remediorum.*" Folio. Vol. I. pp. 984. Vol. II. pp. 985 — 1944. preter indices. 1688.

In the general arrangement of the subject, according to his own system, he has in various instances improved the classes. At the head of each book or class is prefixed a synoptical table of all the chapters or *genera*.

In the particular disposition, after prefixing to each chapter the etymology of the generical name, he gives the character of the *genus*; and in the enumeration of the species, [quotes at length the synonyms of *Caspar* BAUHINE, from his "*Pinax*," and those of *John* BAUHINE, GERARD, and PARKINSON, from their respective histories; seldom introducing others, where the plant was known to any of these writers.

His descriptions of the old plants are taken from the above-mentioned authors. They are commonly abridged, however; and in numberless instances amended, from his own knowledge of the plants. He fails not to notice from whom they are taken, and has every where distinguished the *British* plants from the exotics. He has carefully marked all such as he had not had an opportunity of inspecting himself. He adds the places of

growth, and times of flowering, and subjoins select observations, from the most respectable authorities, relating to the qualities and various uses of them.

In the "History of Trees," the nobler and more capital parts of the vegetable kingdom, as being dignified by the variety of their uses in human œconomy, he has extended his researches, and collected, with much assiduity, a greater variety of interesting particulars. Mr. RAY has purposely avoided entering into nice and critical disquisitions relating to the species; for, besides that this would have swelled his work to an enormous bulk, it was become less necessary, after the descriptions given by *John BAUHINE*, *CLUSIUS*, and others, so much superior to those of their predecessors; and the more curious and critical examiner might be referred to these authors, for ample scope to his curiosity.

Mr. RAY has described, in these volumes, about 6900 plants; including, however, in this number, many which modern botanists have since considered as varieties.

The

The *Addenda* to the second volume contain several interesting catalogues; such are those of ZANONI's History, consisting of new *Italian*, *Swiss*, and *Milanese* plants; those of BREYNIUS; a catalogue of the plants of *Virginia*, observed by Mr. BANISTER; and a compend of those of *Mexico*, from HERNANDEZ, who, at the expence of sixty thousand ducats, had procured the paintings of 1200 species, which perished in a fire of the Escorial.

In the preface to the first volume, Mr. RAY acknowledges his obligations for assistance received from many of his friends. Among those who had more essentially contributed to enrich his work, were, Sir *Edward HULSE*, Dr. *Tancred ROBINSON*, Dr. *SLOANE*, and his near neighbour, Mr. *DALE*. To these he adds, in the second volume, the names of *William COURTINE*, Esq; of the Middle Temple, Dr. *PLUKENET*, Mr. *DOODY*, and Mr. *PETIVER*.

There are copies of RAY's History, with the date of 1693; but I believe the title-page only to be new, the remaining

copies of the impression by *Faithorne*, falling into the hands of *Smith* and *Walford* about that time. Foreign writers mention an edition so late as 1716; but this I suspect to be a mistake, or owing to another transfer of the copies.

After the first edition of the "*Catalogus Plantarum Angliæ*" was out of print, Mr. RAY had been exhorted by his friend, Dr. *Ralph JOHNSON*, to arrange the second according to system; but not having sufficiently elaborated his method, at that time, he declined it; and it came out in 1677, in the alphabetical order.

A third edition being wanted, however, after the publication of the "History of "Plants," he meditated throwing it into the systematic form; and, in the mean time, put forth, in 1688, "*FASCICULUS STIRPIUM BRITANNICARUM, post editum Plantarum Angliæ Catalogum observatarum.*" Lond. 8°. By this little volume, a considerable accession was made to *English* botany: several very rare mountainous or *Alpine* plants, from *Wales*; some scarce ones from

from *Cornwall*; sea plants; new fungi; mosses, and grasses, make their first appearance in this little catalogue.

The "SYNOPSIS," although finished for the press soon after this "*Fasciculus*," was not published, owing to the delay of the printer, till 1690, when it appeared under this title, "SYNOPSIS METHODICA STIRPIUM BRITANNICARUM, in qua tum notæ generum characteristicæ traduntur, tum species singulæ breviter describuntur: 250 plus minus novæ species, partim suis locis inferantur, partim in appendice seorsim exhibentur; cum indice et virium epitome." 8°. pp. 317.

As Mr. RAY had dedicated the "*Alphabetical Catalogue*" to his great friend and *Mecænas*, Francis WILLUGHBY, Esq; so he now shews the same respect to *Thomas*, the only surviving son of his much-honoured patron; whom he exhorts to pursue the example of his excellent father, and for whom he pours forth, in the most energetic language, all those ardent wishes which gratitude and respect for the memory of the father, and love for the pupil, could alone inspire.

In

In the preface, Mr. RAY acknowledges the assistance he received from Mr. BOBART, superintendant of the garden at *Oxford*; Mr. DALE, his neighbour, a learned and ingenious apothecary at *Braintree*; Mr. *Matthew DODSWORTH*; Mr. *Samuel DOODY*, an apothecary in *London*, memorable for having been the first who extended the *Cryptogamous* class; Mr. *Thomas LAWSON*, of *Strickland*, in *Westmorland*; Mr. *James NEWTON*, a diligent and skilful botanist; Dr. *Edward LLOYD*, of *Oxford*; Mr. *James PETIVER*; Dr. *Robert PLOTT*; Dr. *PLUKENET*; Dr. *Hans SLOANE*; Mr. *William SHERARD*, at that time fellow of *St. John's College, Oxford*; and Dr. *Tancred ROBINSON*, to whom Mr. RAY communicated his manuscript of this work, and for whose corrections and additions, he held himself eminently obliged.

The *Appendix* contains a list of scarce plants, communicated by Mr. BOBART; some new plants by Mr. SHERARD; a list of those of *Jersey*, by the same; new and rare species, with critical observations, from Dr. PLUKENET; *musci* and rare plants, by
Mr.

Mr. DOODY ; emendations and additions, by Dr. *Tancred* ROBINSON ; and a catalogue of thirty-four species, common both to *England* and *Jamaica*; communicated by Dr. SLOANE. In this work, Mr. RAY has thrown the observations on the qualities and uses into the index.

From this time the "SYNOPSIS" became the pocket companion of every *English* botanist. It contributed not a little, both to facilitate and improve the science. It diffused the knowledge of system ; and, by obliging those who wished for improvement, to attend more minutely to generical characters, led to a nicer discrimination of both *genera* and *species*.

C H A P. 19.

Account of Ray's works continued—Wisdom of God manifested in the Works of the Creation—Phyfico-theology—Ray considered as a zoologist—*The first truly systematic writer on animals*—Synopsis Quadrupedum—Avium et Piscium—*Publishes Rauwolf's Travels, with valuable additions*—Stirpium Europæarum Sylloge—*Controversy with Rivinus*—*Provincial catalogues of plants for Gibson's Camden*—*Great improvement to English Botany given by Ray*—*Evidenced by the second edition of the Synopsis*—De variis Plantarum Methodis—Epistola ad Rivinum—*His Persuasive to a Holy Life,*

R A Y,

TO this period Mr. RAY had appeared to the public principally as a naturalist; but he now united to this character that of the theologist. It is needless to say, that he succeeded in this department, perhaps beyond most of those who had before written on the same subject. His first publication of this kind, we are told, was originally,

originally, and in its outlines, *College Exercises* only, or *Common Places*. These he now wrought up, and enlarged into a convenient volume, and trusted it to the care of his friend, Dr. *Tancred* ROBINSON, who procured five hundred copies to be printed, under the following title: "THE WISDOM OF GOD MANIFESTED IN THE WORKS OF THE CREATION," 8°. 1691. It was reprinted the next year. The eleventh edition was published in 1743; and a twelfth in 1758; and, I believe, several times since: and it has been translated into foreign languages. These are sufficient testimonies of the esteem with which it was received by the public.

It is not immediately within my plan to enlarge on this work, or to determine whether the arguments *à priori*, or *à posteriori*, are best calculated to obtain the object of it, "Demonstration of the Being of a God." "*Qui historiam naturæ, naturæ etiam Creatorem colit.*" I may be allowed to observe, that Mr. RAY, from that comprehensive view of nature which his mind embraced, was singularly well qualified to display the manifold wonders

wonders of the creation, and the wisdom of its omnipotent Author. And thus, while his penetrating views enabled him to unfold the various œconomy and evolutions of nature to the greatest advantage, his piety and humility give a force to his reasonings and deductions, that carries with it a conviction of that great truth he so sincerely wished to inculcate.

The favourable acceptance the public gave to the "Demonstration," encouraged Mr. RAY to publish, the next year, his "THREE PHYSICO-THEOLOGICAL DISCOURSES concerning the primitive Chaos, and Creation of the World. The general Deluge, its causes and effects. The Dissolution of the World, and future Conflagration." 8°. 1692, and 1693. 1713. pp. 456. 1721. 1732. It is embellished with a plate of the *Apamean* medal, and three tables of figured fossils; and is dedicated to Archbishop TILLOTSON.

This work is a convincing proof of the extensive reading, the various erudition, and multifarious knowledge, of this great and good man. Independent of all the theories

it

it contains, this volume exhibits such an assemblage of facts, relating to the structure of this globe, to the changes it has undergone, and to the history of figured fossils, that it may be read to advantage, even in this age of advanced curiosity, and knowledge in the professed object of this book. Even the fastidious critic, who is versed in all the more modern theories, down to the “Epochas of Nature,” and those of *M. De Luc*, and *De SouLAVIE*, will allow that this volume, when respect is had to the time of its publication, must have conveyed a large share of intelligence to those who were capable of gratification from disquisitions of this nature; and that, with a deference to the opinions of the day, there is yet a freedom of enquiry that distinguishes the author, as a friend to true philosophy, and as a modest and candid enquirer after truth, in those points of natural history, which still continue, and probably long will, to be involved in great obscurity.

In this year, Mr. RAY wrote some “Observations on the Planting of *Maize* instead of *Pease*,” occasioned by a proposal

posal of Sir *Richard* BULKLEY, in which he says, that he had found the greatest yield of pease to be twenty barrels reaped for one sown ; whereas, from one grain of *Indian wheat*, he had calculated the produce would be upwards of 2000 grains for one. These Observations were printed in the *Phil. Trans.* N° 205. Mr. RAY was not sanguine in his expectations from the culture of that grain ; neither have subsequent trials proved the utility of it in this climate.

The botanical labours of this eminent man were now remitted, at least for some time ; and we find, that after the publication of his “ *History*,” and the “ *Synopsis*,” his exertions were turned into another channel, in which he also stood unrivalled in his day. It was not botany alone that he raised from a drooping state ; to zoology, considered as a science, he might be said to have given birth, in these kingdoms ; since, except what himself and Mr. WIL-LUGHBY had performed, nothing of importance on the history of animals existed.

TOPSELL’S “ *Abridgment of GESNER*,”

MOFFAT’S

MOFFAT'S "Book on Insects;" and the short and imperfect essays of CHARLETON, in his "*Onomasticon*," and of MERRET, in his "*Pinax*," were almost the only *English* writers to be consulted. To assert that better helps were wanted, is not to injure, or to degrade those authors. Mr. RAY had been urged by his friends, and particularly by Dr. ROBINSON, to undertake an entire FAUNA ANGLICA, and a history of *Fossils* also; but age and infirmities began now to oppress him, and he thought himself inadequate to the attempt. He lived, however, to perform more than his fears, or his humility permitted him to hope.

In 1693, he published his "SYNOPSIS METHODICA ANIMALIUM, QUADRUPE-DUM, et SERPENTINI GENERIS; *vulgarium notas characteristicas, rariorum descriptiones integras, exhibens: cum historiis et observationibus anatomicis, perquam curiosis. Præmittuntur nonnulla de animalium in genere, sensu, generatione, divisione, &c.*" Lond. 8°. pp. 336.

In this volume we see the first truly systematic arrangement of animals, since the days of ARISTOTLE; an arrangement which

his successors in the same line have equally applauded, and availed themselves of. It is professedly the basis of that method, by which the present eminent zoologist of this nation, has chosen to convey his learned publications, and by which he has not less happily diffused a taste for this science, than he has successfully improved its store.

In treating on animals in general, introductory to his work, he discusses some important questions, which had not then ceased to agitate the philosophical world. He controverts, with extreme force of reasoning, the ideas of equivocal or spontaneous generation; the *Lewenhoekian* hypothesis; and that of all animals being created from eternity, and only latent in an involved state. I know not where the reader can see these questions discussed with equal conciseness and judgment united.

Mr. RAY's Distribution of Animals is not wholly founded, as to the grand divisions, on the *Aristotelian* distinctions; though he admits many of them. It is not within my plan to enter on this subject; it is sufficient to observe, that *Quadrupeds* here form two great divisions,

divisions, as they are *hoofed* or *digitated*; the former, as they are *whole* or cloven; the latter, as they are *divided* into more, or fewer claws; admitting also of subdivisions or *genera*, from the number of the claws, and in some, from the consideration of the teeth.

At the time when Mr. RAY lived, few people had acquired a taste for this kind of knowledge, and commerce had not lent her friendly aid, as in later times. What animals came under his own inspection, he has described with his accustomed accuracy; from GESNER and ALDROVAND he borrows his descriptions of others; and many later discovered subjects he drew from PISO and MARCGRAAVE, from CLUSIUS, HERNANDEZ, LAET, and NIEREMBERG.

In the course of this work, he has, in various instances, given the anatomical structure, from Dr. TYSON, from the "*Parisian Dissections*," and other works. Throughout the whole, he has shewn how intimately he was acquainted with the learning of the ancients, and particularly with ARISTOTLE,

whom, as the parent of zoological knowledge, he failed not to consult on all occasions, but by no means implicitly to follow, in his subtleties and obscurities.

On finishing the “Synopsis of Quadrupeds,” Mr. RAY immediately drew up that of the *Birds* and *Fishes*. This was an easier task at this time, since they are to be considered as compends of his preceding labours with his friend, Mr. WILLUGHBY; although there were many things new in both, and that of the *Fishes* was very greatly improved as to the arrangement and method. He informs us, that the additions were, the *Mexican* birds, from HERNANDEZ; some descriptions of new species, out of NIEUHOFF; MARTIN’S *Birds* and *Fishes* of *Greenland*; SIBBALD’S *Whales*; SLOANE’S *Jamaica* *Birds* and *Fishes*; and some from the *Leyden* Catalogue, by Dr. ROBINSON.

In these branches of nature, Mr. RAY again appears as the parent of method. The accurate BRISSON regards RAY and WILLUGHBY, as the first true systematic writers on birds. These works were finished
in

in the year 1693 or 1694, as we learn from Mr. RAY's letters, and from the testimony of his friend and neighbour, Mr. DALE. Yet, excellent as they were, so scanty was the taste for natural history at this period, that the manuscripts lay unpublished in the booksellers hands, till they were purchased by Mr. INNYS, and prepared for the press by Dr. DERHAM, who added the figures, and inserted Mr. BUCKLEY's Birds from *Madras*, and Mr. JAGO's *Gornish* Fishes. They were published in 1713, under the titles of "SYNOPSIS METHODICA AVIUM." 8°. pp. 198. t. 2; and "SYNOPSIS METHODICA PISCIVM." 8°. pp. 162. t. 1.

In the same year, 1693, Mr. RAY became the editor of a translation of "Dr. RAU-
"WOLF's Travels." This physician, who was the next after BELON, whom the love of natural history alone, led to travel into the east, spent the years 1573-4-5 in traversing *Syria*, *Mesopotamia*, *Palestine*, and *Ægypt*, induced, as he tells us, by his desire to behold, in the native places, the plants of the *Greek* and *Arabian* physicians.

His "Travels" having been published in 1583, in the *German* language, had hitherto been locked up from the *English* reader. Sir *Hans* SLOANE having, however, read them, was induced, in concert with Capt. HATTON, to procure a translation of them, which was done by *Nicholas* STAPHORST. This version was put into Mr. RAY's hands, to revise and correct. He did more; he made a choice selection from other authors, who had made the same tour, *BELON*, *ALPINUS*, Sir *George* WHEELER, &c. and he drew up a Catalogue of the more rare Plants of those countries through which *RAUWOLF* travelled; and added lists of those of *Ægypt* and *Crete*. From this circumstance, the book has gone by the name of "RAY's COLLECTION OF TRAVELS;" and it was reprinted with his own "Observations," in 1738. *RAUWOLF* made an "*Herbarium*," while in the east; which, with his *European* plants, constituted four large volumes. These became the property of Queen *Christina*, and afterwards, by her means probably, of *Isaac* VOSSIUS, who informed

formed Capt. HATTON, that 400 *l.* sterling had been offered for them. They were purchased of his heirs by the university of *Leyden*; and the late Dr. *Frederick GRONOVIUS* constructed from them an elegant and learned “*Flora Orientalis* ;” of which he much enhanced the value, by prefixing to it *Melchier ADAMS*’s “*Life of RAU-“ WOLF*,” with large additions of his own.

The “*CATALOGUS STIRPIUM IN EXTERIS REGIONIBUS OBSERVATARUM*” being out of print, Mr. RAY was induced to give a new edition of it, with such large augmentations, as to make it a new work. He added from *CLUSIUS*, from the *BAUHINES*, and other authors, a number of plants growing in those regions through which he passed in his tour; and so many catalogues from other authors, as to render it a tolerably complete list of all the *European* plants, not natives of *England*. As it does not immediately respect *English* botany, it will be sufficient to recite the title-page, from which its scope may be understood :

“*STIRPIUM EUROPÆARUM extra Bri-*

R 4

tannias

tannias nascentium SYLLOGE. *Quas partim observavit ipse, partim à C. Clusii Historia; C. Baubini Prodromo, et Catalogo Basiliensi; F. Columnæ Ecpbrasi; Catalogis Hollandicarum A. Commelini; Allorfinarum M. Hoffmanni; Sicularum P. Bocconi; Monspeliensium P. Magnoli; collegit J. RAIUS. Adjiciuntur Catalogi rariorum Alpinarum et Pyrenaicarum, Baldensium, Hispanicarum Grisei, Græcarum et Orientalium, Creticarum, Ægyptiacarum, aliique: ab eodem.* Lond. 1694. 8°. pp. 445.

In the preface to this work, Mr. RAY, for the first time, entered into controversy; having taken occasion to throw out some strictures on the method of botany published by RIVINUS in 1690. It is not enough interesting at this day to dwell on the nature of it: It is sufficient to observe, that our veteran in science was dissatisfied with the *German*, for throwing the trees promiscuously into the classes with other plants, and for breaking into the natural orders, for the sake of agreement in the flower alone. In fact, RIVINUS's method being founded wholly on the flower, to
which

which part RAY had paid but small regard, the sources of controversy were endless; since the fundamental principles of each were totally irreconcilable.

About this time Mr. RAY communicated "The Provincial Catalogues of Plants," printed at the end of each county, in the edition of "CAMDEN'S *Britannia*," published in 1695 by Mr. GIBSON. His repeated travels throughout most parts of *England*, for the sole purpose of investigating the subjects of nature, had enabled him to accomplish more than had been done by any man before his time; and his unquestionable skill and accuracy, added an authenticity to these lists, which could not easily have been derived from any other hand.

To the county of *Cornwall* Mr. RAY added many other particulars; which, however, were not printed, probably because the corresponding circumstances could not be procured from other counties. These were, "Catalogues of the Sea Fish, and Sea Fowl, with the synonyms;" some account of two or three sorts of stone dug there; of sea sand, as manure; an account of the
burlers,

hurlers, and other stones; and notices respecting the manners and language of the inhabitants.

Such as are conversant with that science, which was the favourite object of Mr. RAY, must be sensible that nothing could have happened more conducive to the revival and improvement of it at this juncture, than the circumstance of its having been taken up by a man of such patient industry, capable at the same time of giving it all the embellishments, and advantages that learning could afford. They will readily grant that his writings and example alone, added more vigour, and brought more disciples to this school of natural science in *England*, than all the exertions of foregoing writers.

I cannot confirm and illustrate the truth of this position more effectually, than by calling to the attention of the curious in this kind of knowledge, the vast augmentation it acquired, in the interval between the publication of Mr. RAY's "*Catalogus Plantarum Angliæ*," and that of the "*Synopsis*;" and more especially between the time of the first and second edition of the latter

latter work ; during which, exclusive of the discovery of many subjects, among what were called the *more perfect* plants, a new and very extensive field had been opened, by exciting attention to the *less perfect* (as they were then accounted) and minuter kinds of vegetables, the *Fungi*, *Fuci*, *Musci*, and *Algæ*, known now by the name of *Cryptogamiæ*. During the first of these periods, 250 species had been added to the *English Flora* ; and the accession in the last exceeded that number.

In no part of *Europe* had the same progress been made in the investigation of these hitherto much-neglected subjects, as in *England*, during the period above mentioned. This is sufficiently evinced by comparing the second edition of the “SYNOPSIS” with the contemporary writings of foreign botanists.

This second edition of the “SYNOPSIS” was printed in 1696. 8°. pp. 346. Mr. RAY himself had but a small share in the augmentations that were made to this edition. His advancing years and infirmities prevented him from making excursions. His
principal

principal auxiliaries are mentioned in the preface; in which, additional to the names in the former "SYNOPSIS," we meet with those of Mr. *Edward LLHWYD*, *Walter MOYLE*, Esq; and Mr. *William VERNON*, fellow of *St. Peter's College, Cambridge*.

To those who are sensible of the obligations which the science owes to Mr. RAY, it cannot but be grateful to read, with what satisfaction the good man records, in this preface, the progress he had lived to see his favourite study make in his own country, and with what delight he augurs and contemplates its future improvement. In the space of little more than twenty years, and under his own pen, he had seen the *English Flora* acquire an accession of upwards of 500 new subjects. The "CATALOGUS PLANTARUM ANGLIÆ" of 1670, containing about 1050, and the second edition of the "SYNOPSIS" in 1696, full 1600 species; and, notwithstanding these have not all stood the test of the discriminating character of the present age, yet, in justice to this great man, and his associates, it must be acknowledged, that

that the retrenchments are comparatively few.

With this edition of the "SYNOPSIS," was published the "DISSERTATIO DE VARIIS PLANTARUM METHODIS BREVIS;" in which Mr. RAY shews, that the separation of plants into classes and genera from the fructification alone, must be a very gradual and progressive affair; that it was not easy to exclude the habit from having a share in this distribution, since there were many plants that were seldom or never seen in flower by the early botanists. He also observes, that numberless plants, which agree in the structure of the flower; differ materially in habit, and others *vice versa*. And although his own method is principally founded on the fruit, yet he freely acknowledges its imperfections; but thinks the same objections hold against the flower; which he illustrates by shewing, in TOURNEFORT's system, the uncertainty of the bounds between the *Flores infundibuliformes*, *hypocrateriformes*, and the *caryophyllei*. If Mr. RAY paid less regard to the flower than its importance seemed to demand, it seems rather to have arisen from the

the

the principles of his method, than from his want of opportunities of examination, owing to his distance from botanical gardens, as was alledged by his opponents ; a circumstance, however, which he very feelingly laments in the preface to his "METHODUS," and elsewhere.

To this is annexed, "EPISTOLA de METHODO PLANTARUM *viri clarissimi D. A. Q. Rivini ad Raium, cum ejusdem responsoria, in qua D. Jos. Pitton Tournefortii, M. D. Elementa Botanica tanguntur.*"

On the method of RIVINUS, Mr. RAY, as was before noticed, had thrown out some strictures in the preface to his "*Sylloge*," which drew from that author the answer here published, and Mr. RAY's reply ; in which our author takes occasion also to defend his method from the objections of TOURNEFORT, who had been unbecomingly severe in some animadversions made in the "*Elements of Botany*," published in 1694. TOURNEFORT, however, afterwards did ample justice to the merits of our author.

The modern botanist sees that all these controversies are become too little interesting

ing to dwell upon at this time. The principles of the *Corollistæ*, and the *Fruetistæ*, as LINNÆUS styles them, can never be assimilated, and all attempts to reduce the whole vegetable kingdom into natural classes have hitherto failed.

In 1697, he wrote "Some Observations
" on the Poisonous Effects of a Root eaten
" instead of Parsneps," supposed to have
been that of the Hemlock; but of which
Mr. RAY had some doubt, alledging, that
it was more probably the *Cicutaria vulgaris*,
(*Chærophylum sylvestre*, Lin.) See *Phil.*
Transf. N° 231. In N° 238, he communi-
cated "Remarks on the Poisonous Effects
" of the *Oenanthe crocata*," too fatally
confirmed by later mistakes of the same
kind.

In the year 1700, Mr. RAY published
" A PERSUASIVE TO A HOLY LIFE, from
" the Happiness which attends it both in
" this World and in the World to come."
Lond. 8°. Reprinted in 1719. pp. 126.
He tells us it was drawn up at the request
of his friend, Mr. *Edmund Elys*, and that it
is composed on the model of Bishop WIL-
KINS'S

KINS's. "Treatise on Natural Religion."

It is wholly of a moral and practical nature, written in a plain, but forcible and argumentative style, and is entirely destitute of any of those enthusiastic or mystical opinions, which so highly tinctured the writings of many divines of the last century. On the contrary, Mr. RAY, ever consistent and rational, although he deduces his principal motives to the practice of virtue, as conducive to happiness, even in this life, from the precepts of Christianity; yet does not disdain, particularly in treating on pleasure, on riches, and the advantages of temperance, to enforce his arguments by opinions and apophthegms from the writings of the philosophers and moralists of ancient Greece, and Rome.

C H A P. 20.

Account of Ray continued—Improved edition of the Methodus Plantarum—Outlines of Ray's system—Third volume of the Historia Plantarum—Methodus Insectorum—His Death and Character.

R A Y.

THE peaceable mind of Mr. RAY could not delight in the contentious field of controversy; on the contrary, he regretted the occasions that drew him into it: yet were they not without use, since they unquestionably stimulated him to purify and correct his own *Methodus*. This he effected in the year 1698, although at this time much declined in his health, being afflicted with ulcers of the lower extremities, the pain of which rendered his nights frequently sleepless, and wholly prevented him from making excursions to *London*, as he much desired, to examine the gardens and *herbaria* of the curious.

So small, however, was the demand for books in this science, at the entrance of this century, that the *London* booksellers were unwilling to risk the printing of it : and it was finally sent to *Holland*, and printed at *Amsterdam*, under the care of Dr. HOTTON, the botanical professor at *Leyden*, who supervised the press, and procured 1100 copies to be thrown off, under the title of "METHODUS PLANTARUM EMENDATA ET AUCTA: accedit Methodus Graminum, Juncorum, et Cyperorum specialis." 8°. pp. 202. 1703. Dr. HOTTON gave a further sanction to the system of his friend ; he taught it in his lectures to the pupils of that university, and informed Mr. RAY of the good acceptance it met with on the continent, particularly in *Italy*. This volume was reprinted at *Amsterdam* in 1710, and at *Tubingen* in 1733.

In the preface he recapitulates his own progress in the formation of his system, and dates it from the tables drawn up in 1667 for the use of Bishop WILKINS. He very justly reprehends Dr. MORISON, for affecting to have formed his method entirely

from his own observations, without acknowledging the smallest aid from former writers ; briefly recites his objections to the methods of RIVINUS, TOURNEFORT, and HERMAN ; and defends his own. He establishes some axioms, to be observed in framing a system of botany. In fact, Mr. RAY's method, though he assumes the fruit as the foundation, is an elaborate attempt, for that time, to fix natural classes. He establishes it as a rule, that no plant is to be separated from its tribe for a single note of difference ; but that all are to be assimilated, as far as habit will allow. The characters of the *genera* are, however, highly incongruous ; they are taken from vague principles, such as the shape of the leaf, colour of the flower, taste, smell, and sometimes from the size of the plant, and other as unstable distinctions.

In this amended edition, Mr. RAY still adheres to the ancient division into trees and herbaceous plants, having dropped the distinction of shrubs, preserved in the first edition. Here, all herbaceous, and shrubby-stalked plants are divided into twenty-five *genera* or classes ; as follow :

1. *Submarinæ*.
2. *Fungi*. In the first *Methodus*, these two classes were formed into one class, or synoptical table.
3. *Musci*.
4. *Capillares*.
5. *Apetalæ*. Before, in two tables.
6. *Planipetalæ lactescentes*.
7. *Discoideæ*. Before, in two classes.
8. *Corymbiferæ*. Before, in two classes.
9. *Capitataæ*. Before, in two classes.
10. *Herbæ semine nudo solitario, flore simplici perfectæ*.
11. *Umbelliferæ*.
12. *Stellatæ*.
13. *Asperifoliæ*.
14. *Verticillatæ*. Before, divided into two ; *Herbaceæ, et Fruticosæ*.
15. *Polyspermæ*. Formerly, in two classes.
16. *Pomiferæ*.
17. *Bacciferæ*.
18. *Multisiliquæ*.
19. *Vasculiferæ, Monopetalæ*. Before, in three classes ; *et Dipetalæ*.
20. *Siliquosæ, et Siliculosæ*. Formerly, in three classes ; *et Anomalæ*.

21. Pa-

- 21. *Papilionaceæ*; *f. Leguminosæ*. Formerly, in four classes.
- 22. *Pentapetalæ*. Before, in two classes.
- 23. *Floriferæ*, *Graminifoliæ*. Formerly, in four classes; *et Bulbosæ affines*.
- 24. *Stamineæ*, *Graminifoliæ*. Before, in three tables.
- 25. *Anomalæ*.

Trees, and Shrubs.

- 26. *Arundinaceæ*.
- 27. *Flore a fructu remoto*; *seu Apetalæ*.
- 28. *Fructu umbilicato*; *f. Pomiferæ*, *et Bacciferæ*.
- 29. *Fructu non umbilicato*; *f. Pruniferæ*.
- 30. *Fructu sicco*; *non filiquoso, nec umbilicato*; *et Miscellaneæ*.
- 31. *Siliquosæ*, *non Papilionaceæ*.
- 32. *Siliquosæ*, *Papilionaceæ*.
- 33. *Anomalæ*.

At this time, the consideration of Mr. RAY's method is a matter of mere curiosity; yet, in justice to this great man, it must be remarked, that his system, though less artificial than that of CÆSALPINE, is

much more highly elaborated than that of MORISON: and, though Mr. RAY must have taken infinite pains with it, yet is it difficult in practice; since the bases of the classes are not uniform. Of the thirty-three, however, twelve are nearly composed of natural orders. Such are the following:

<i>Fungi,</i>	<i>Asperifoliæ,</i>
<i>Musci,</i>	<i>Verticillatæ,</i>
<i>Capillares,</i>	<i>Pomiferæ,</i>
<i>Planipetalæ,</i>	<i>Siliquosæ,</i>
<i>Umbelliferæ,</i>	<i>Leguminosæ,</i>
<i>Stellatæ,</i>	<i>Culmiferæ,</i>

The remaining classes are combined of subjects less connected by habit and structure; and are therefore subject to more arbitrary rules, drawn from the consideration of some one, or more parts, in the fructification.

In the "METHODUS Graminum, Junco-
rum, et Cyperorum specialis," annexed to this
book, Mr. RAY's distribution rests princi-
pally on what may be called the habit of
the fructification; all those genera, which
in

in the *Linnaean* system are known by the names of *Phalaris*, *Alopecurus*, *Dactylis*, *Agrostis*, *Aia*, *Poa*, *Briza*, &c. being called *Gramen* simply, with the epithets of the old authors annexed, expressive of the mode of bearing the parts of the fructification, whether in spikes, or panicles; as, *Gramen triticeum*; *Gramen loliaceum*; *typhinum*; *Gramen paniculatum*; *miliaceum*, &c. In this *Conspectus*, however, all the species are introduced, to the amount of two hundred.

Sixteen years had now elapsed since the publication of his "History of Plants;" in which interval botany had assumed a new face, and experienced a much greater revolution and accession, than had ever taken place before. System had been studied, and in some measure established, both at home and abroad. An incredible number of new plants had been introduced, from all parts of the world, and cultivated with extreme care in the gardens of *Europe*. In the mean time, these circumstances had given rise to a great number of valuable publications. The remaining six volumes of

that inestimable work, the "HORTUS MALABARICUS," had appeared: BREYNIUS, HERMAN, TOURNEFORT, PLUMIER, PLUKENET, BOCCONE, COMME-LINE, BOBART, CUPANI, VOLKAMER, and RIVINUS, had enriched botany with valuable performances. These large augmentations to the science induced Mr. RAY, notwithstanding his advanced years and ill health, to attempt a collection of these scattered materials, in order to form a supplemental volume to his "History;" and his industry enabled him to effect his purpose. Additional to the assistances derived from all these printed works, he had access, by the favour of Sir *Hans SLOANE*, to the MS. of his "History of *Jamaica Plants*" (of which the "*Prodromus*" had been published in 1696) with liberty to select what he thought proper to his design.

From the same gentleman he enjoyed the benefit of an *Herbarium* of several hundred new and undescribed plants, collected in *Maryland*, by Mr. VERNON and Mr. KREIG, who had made a voyage thither for the
sole

sole purpose of gratifying their taste in botany. Mr. PETIVER freely communicated his stores, at that time very ample, though afterwards abundantly more so; and Dr. SHERARD engaged, besides supplying more than a thousand species himself, to take the trouble of inspecting the whole work before it went to the press, and of making such corrections and additions as he judged proper.

It was the last of his works published in his life-time, and came out in 1704, with the following title :

“ HISTORIÆ PLANTARUM TOMUS TERTIUS, *qui est SUPPLEMENTUM duorum præcedentium ; species omnes, vel omiffas, vel post volumina illa evulgata editas, præter innumeras fere novas et indiçtas ab amicis communicatas, complectens : cum synonymis necessariis, et usibus in cibo, medicina, et mechanicis.*” Lond. folio. pp. 666 ; and the “ *Dendrologia,*” pp. 135. App. pp. 137.

The distribution is the same as that of the two former volumes. In a compilation of this kind, collected from so numerous a set of authors, and in many instances from dried and imperfect specimens, there must necessarily

necessarily arise a multitude of repetitions. The author was sufficiently aware of this; but it was unavoidable. In this volume there are upwards of 11,700 plants enumerated.

The Appendix contains several catalogues, which must have been interesting to the curious at that time. Father CAMELL, a learned Jesuit of *Manila*, who had not only described, but delineated, a great number of the plants of *Luzone*, transmitted his work to Mr. RAY; and it forms an extensive part of this Appendix. It must have been much regretted, that the Rev. Father had not been furnished with books to have enabled him to adapt the synonyms; since there are few instances in which any other names occur, than the *Spanish*, and the indigenous appellations of the natives and *Malays*.

Mr. RAY then gives a list of TOURNEFORT's oriental discoveries, from the "*Corollarium*;" those of DAMPIER, from *New Holland* and elsewhere, and of MARTENS's *Greenland Plants*; of COMMELINE's *Rare Exotics*; a copious Catalogue of *Chinese*,
Madras,

Madrafs, and *African* Plants, communicated by Mr. PETIVER, of which, those from *Madrafs* had been collected by Mr. BROWNE, a surgeon at that settlement; and lastly, a list of the new, or hitherto very imperfectly described species, contained in Mr. PETIVER's *Hortus Siccus*, amounting to upwards of 800.

An advertisement had been printed at the end of the first volume of Mr. RAY's "History," in 1688, inviting to a subscription for a set of figures to the work; and it was proposed, that those belonging to each tribe or class, should be published in regular succession; but it did not succeed. The scheme was again revived, while the Supplement was printing; and, among other of Mr. RAY's friends, Dr. COMPTON, bishop of *London*, had given his patronage, and strongly recommended it. Conferences were held with Dr. SHERARD, Sir *Hans* SLOANE, Dr. ROBINSON, and Mr. PETIVER, relating to it; but it was relinquished as impracticable.

Mr. RAY's infirmities were very pressing upon him during the later years of his life.

In

In a letter, written in the spring of 1702, he informs Mr. DERHAM that he had not been half a mile from his own house for four years. Yet, under these circumstances, he wrote his supplemental volume to his "History of Plants," which, he says, had engrossed almost his whole time for two years.

We have now brought Mr. RAY's botanical works to a conclusion; but his labours did not cease here. His active and indefatigable mind prompted him, at the age of seventy-five, to begin a work on *Insects*; to which he had been encouraged by Dr. DERHAM; and for which he had been accumulating materials during many years. This was intended to comprehend only the *English* species; although, at the same time, his friends were wishing to engage him to describe the exotics of the *London Musea*, which were then beginning to abound in these subjects.

He had paid some attention to the history of *Spiders*, indeed, many years before, when intimately connected with Dr.

LISTER;

LISTER; but the greater part of his work was drawn up from his own actual descriptions, and partly from Mr. WIL-LUGHBY's papers, and the contributions of friends, Mr. PETIVER, Mr. DANDRIDGE, Dr. SLOANE, Mr. MORTON, and Mr. STONEFLEET.

He tells us, that in the later years of his life he had discovered 300 kinds of *Papilio*s, diurnal and nocturnal; and knew there were many more. The *Beetles*, he observes, were as numerous, and the *Flies* not less so. I mention these circumstances to prove the extensive knowledge of nature which this extraordinary man possessed, at an æra when he stood so nearly alone in these branches of science. He did not live to finish this work. It was published by Dr. DERHAM in 1710, in 4°. pp. 398.

I believe Mr. RAY was the first who gave to these minuter animals a real and scientific distribution. He had drawn up a short "METHODUS INSECTORUM," which was published the year after his death. Of the history itself, it is sufficient to say, that it bears all the characters of that accurate, discriminating,

discriminating, and systematic genius, which guided him in all his researches in the field of nature; and that it is every where quoted by the eminent *Swede* with the highest commendations, for the faithful descriptions it contains.

Mr. RAY's infirmities and afflictions, painful and grievous as they were, did not, we are told, prevent him from prosecuting his studies till within about three months before his death; which event took place on Jan. 17, 1704-5.

He died at *Black Notley*, and was buried, as Dr. DERHAM says, according to his own desire, in the church of that parish. The writers of the "General Dictionary," in the mean time, inform us, that, "although the rector of the parish offered him a place of interment in the chancel of the church, yet he modestly refused it, choosing rather to be buried in the church-yard with his ancestors, where a monument was erected to him," as Dr. DERHAM relates, at the charge of some of his friends, with a *Latin* inscription; which may be seen in the "General Dictionary," and in Mr. SCOTT's "Remains;"

“Remains;” and of which I insert a copy below *.

As Mr. RAY did not inherit any paternal estate, and had often refused preferment, his circumstances could never have been affluent; and the legacy of Mr. WILLUGHBY is said to have been the greatest part of what he enjoyed. His own estate, whatever that might be, he settled on his wife.

He

* The Inscription on Mr. RAY's Monument.

Eruditissimi Viri JOHANNIS RAY, M. A.

Quicquid mortale fuit

Hoc in angusto Tumulo reconditum est,

At scripta

Non unica continet Regio :

Et Fama undiquaque celeberrima

Vetat Mori.

Collegii SS. Trinitatis Cantab. fuit olim Socius,
Nec non Societatis Regiæ apud Londinenses Sodalis,

Egregium utriusque Ornamentum.

In omni Scientiarum Genere,

Tam divinarum quam humanarum

Verfatissimus :

Et sicut alter Solomon (cui forsan unico secundus)

A Cedro ad Hyssopum,

Ab Animalium maximis ad minima usque Insecta

Exquisitam nactus est Notitiam.

Nec

He had four daughters, three of whom survived him. “ He left a small legacy to the
 “ poor of his own parish, and five pounds to
 “ Trinity College, in *Cambridge*, to purchase books for the library there. All
 “ his collections of natural curiosities he
 “ bestowed

Nec de stantis solum quæ patet Terræ Facie,
 Accuratissimè differuit;
 Sed et intima ipsius Viscera sagacissimè rimatus,
 Quicquid notatu dignum in Univerſi Naturâ
 Descripsit.
 Apud exteras Gentes agens,
 Quæ aliorum Oculos fugerant, diligenter exploravit,
 Multaque scitu dignissima primus in Lucem protulit.
 Quod superest, eâ Morum Simplicitate præditus,
 Ut fuerit absque Invidiâ doctus:
 Sublimis Ingenii,
 Et (quod raro accidit) demissi simul Animi et modesti.
 Non Sanguine et Genere insignis,
 Sed (quod majus)
 Propriâ Virtute illustris.
 De Opibus Titulisque obtinendis
 Parum sollicitus,
 Hæc potius mereri voluit, quam adipisci:
 Dum sub privato Lare sua Sorte contentus,
 Fortunâ lautiori dignus consenuit.
 In Rebus aliis sibi Modum faciliè imposuit,
 In Studiis nullum.

Quid.

“ bestowed on his friend and neighbour,
 “ Mr. *Samuel DALE*, author of the *Phar-*
 “ *macologia*, to whom they were delivered
 “ about a week before his death.”

Mr. RAY's posthumous papers were en-

Quid plura ?
 Hisce omnibus
 Pietatem minimè fucatam adjunxit,
 Ecclesiæ Anglicanæ
 (Id quod supremo Habitu confirmavit)
 Totus et ex Animo addictus.
 Sic bene latuit, bene vixit Vir beatus,
 Quem præsens Ætas colit, Postera mirabitur.

This monument beginning to want repair by standing exposed in the church-yard, was removed and set up in the chancel of the church; and to the epitaph is added, on the table of the east side, what follows :

Hoc Cenotaphium
 Olim in Cœmeterio sub Dio positum,
 Inclementis Cœli Injuriis oblitteratum,
 Et tantum non collapsum,
 Refecit et sub Tectum transposuit
 J. LEGGE, M. D.
 xvi kal. Aprilis, A. D. 1737.

On the west side,

J. RAY, { Nat. 29. Nov. 1628.
 { Ob. 17. Jan. 1705-6.

trusted by his widow to the care of Dr. DERHAM; who, after publishing the "HISTORIA INSECTORUM," selected a number of his letters, and printed them, in 1718, under the title of "PHILOSOPHICAL LETTERS between the learned Mr. RAY and several of his Correspondents, natives and foreigners." 8°. pp. 367.

This collection contains 218 letters; of which, sixty-eight were written by Mr. RAY himself. Among his correspondents, the most frequent were Dr. LISTER, Sir *Philip* SKIPPON, Dr. *Tancred* ROBINSON, Sir *Hans* SLOANE, Mr. LLWYD, Mr. JESSOP, Mr. JOHNSON, and Mr. OLDENBURGH. The first of Mr. RAY's letters bears date in 1667, the last in 1705.

The correspondence of learned and scientific men, seldom fails to be a welcome present to those of similar literature and pursuits; for, besides the personal interest we take in their concerns, they commonly delineate, in the most faithful colours, the characters of the writers, frequently ascertain discoveries, and enable their successors to trace the progress of knowledge in a
more

more interesting manner than by historical detail.

As the general subject of these letters is natural history, so botany bears a prevailing portion. Besides numberless critical observations that occur on particular species, we meet with a long catalogue of the rare plants of the north of *England*, by Mr. LAWSON; Dr. PLUKENET's Observations on the first edition of the "*Synopsis*;" those of Dr. PRESTON on various *British* Plants; a paper of *Thomas WILLISEL*'s specifying the different kinds of trees, on which, in his travels, he had seen the *Misfeltoe* growing; and a list of such exotics as were thought rare at that time in the *Chealsea* Garden, and at *Fulham*.

There is, moreover, among these letters, an interesting paper, written by Mr. RAY himself, in answer to the question, "What number of plants there are in the world?" in which he discusses the difficulty, or impossibility, of gaining satisfaction on this point, arising from the want of sufficient bounds between species and variety. He communicated to the Royal Society some

remarks on this head, which were printed by Dr. BIRCH, in the third volume of the "History of the Royal Society."

Dr. DERHAM meditated writing the life of Mr. RAY; but he appears not to have fully executed his plan. His papers, however, were published by Mr. SCOTT, in 1760, under the title of "Select Remains of the learned *John RAY*." 8°. pp. 336. To these are annexed three of the *Itineraries*, which constitute the greater part of the book. They are evidently short notes only, never intended for the public eye. Some of Mr. RAY's devotional pieces accompany this collection; and three letters to Dr. DERHAM; with a *Latin* letter of advice and instructions to his pupils, the Mr. WILLUGHBYS.

There is said to be still extant a manuscript of Mr. RAY's, under the title of "*Catalogus Plantarum domesticarum quæ aluntur Catabrigiæ in hortis academicorum et oppidanorum*." In this, he chiefly makes use of the *synonyma* of the two BAUHINES, and of GERARD and PARKINSON.

Mr. RAY had the singular happiness of
devoting

devoting fifty years of his life to the cultivation of the sciences he loved. Incited by the most ardent genius, which overcame innumerable difficulties and discouragements, his labours were, in the end, crowned with a success, before almost unequalled. He totally reformed the studies of botany and zoology; he raised them to the dignity of a science, and placed them in an advantageous point of view; and, by his own investigations, added more real improvement to them in *England*, than any of his predecessors.

He invented and defined many terms, expressive of ideas before unknown to the naturalists of *England*; and introduced many others, from writers of the best note. As he wrote *Latin* in great purity, and with great facility, he gave his subjects all the embellishments that learning could bestow; and his extensive erudition, and knowledge of philosophy at large, enabled him to add many collateral ornaments, and useful observations, with an aptitude and judgment that has been much applauded.

The extent of his improvements in science procured him the admiration of his

contemporaries, and have justly transmitted his name to posterity, among those who have done honour to their age and country. Even learned foreigners have been eloquent in his praise. *French* writers have stiled him the “ *English* TOURNEFORT ;” an eulogy that sufficiently evinced the high opinion they had of his merit. And the late eminent HALLER not only attributes to RAY the merit of improving and elevating botanical knowledge, but from his life dates a new æra in the records of the science.

But Mr. RAY’s enquiries were not limited to natural knowledge. His Foreign Travels and his Itineraries prove, that antiquities, polity, government, and legislation, attracted a share of his regard ; as his philological books are evidences of his attention to language, and of his desire to improve and illustrate his native tongue.

To all these endowments he joined an unremitting industry and perseverance in the prosecution of his studies ; and, what marks a fortitude of mind as uncommon as it is enviable, his assiduity seemed to strengthen
with

with his age, and to bid a defiance to the encroachments of infirmity, and the prospect of dissolution. I call to witness the magnitude of the attempt, and successful issue of his exertions, in writing the supplemental volume to his "History of Plants," and in beginning the "*Historia Insectorum*" at so late a period of his life.

His singular modesty, affability, and communicative disposition, secured to him the esteem of all who knew him; and his eminent talents as a naturalist and a philosopher procured him many patrons and friends, and preserved him from that obscurity, which would otherwise probably have been his lot: for, notwithstanding his learning and probity, as his principles did not accord with those of the times, they were adverse to his fortune, and he gained no emoluments in the church. He had relinquished his fellowship at the commencement of the *Bartholomew* act, not, as some imagined, from his having taken the *Solemn League and Covenant* (for that he never did, and often declared, that he ever thought it an unlawful oath), but because he could not declare,

agreeably to the terms of the act, that the oath was not binding on those who had taken it. Hence too, his constant refusal of preferment afterwards, occasioned him to be ranked, by many, among the nonconformists, although he lived and died in the communion of the church of *England*. He had seen, with deep regret, the disorders of the commonwealth and the usurpation, and afterwards, not less, the threatening aspect of the reign of *James II.*

His strong attachment to the principles of civil and religious liberty, is manifested by his animated stile, in the preface to his "*Synopsis* ;" where he expresses, in glowing terms, his joy and gratitude, for having lived to see those blessings established by the Revolution,

The character of Mr. RAY cannot be contemplated by those who have a true relish for the studies of nature, without a high sentiment of respect and gratitude; nor by those who consider the exemplariness of his life as a man, and his qualifications as a divine, without veneration.

There are two engraved portraits of Mr.

RAY

RAY prefixed to his works, both from a painting by *Faithorne*; one by *W. Elder*, before his "SYLLOGE," in 1693, which seems to have been copied for the "METHODUS EMENDATA," in 1703; and the other by *Vertue*, in 1713, prefixed to the "Phyfico-theological Discourses." In both these, he is represented, as Mr. AMES describes it, in "an oval frame, with hair, whiskers, band, and canonical habit." These engravings represent Mr. RAY in the latter stage of his life*.

* In dedicating plants to the worthies of botanical science, the name of RAY challenged a dignified place; and the liberal-minded foreigner, whose name has before occurred on these occasions, forgot not so just a tribute. PLUMIER called a new plant of the *dioecious* class, which bears the habit of *bryony*, and is nearly allied to the *yams*, which he first discovered in the isle of *Domingo*, by the name of JAN-RAJA, in honour of our illustrious countryman. LINNÆUS, who had comparatively few opportunities of correcting PLUMIER, established the *genus*, but more aptly changed it to RAJANIA, and enumerates three species. He could not adopt the still more analogous term of RAIA, since it had long been preoccupied in the animal kingdom; and it had been justly constituted an axiom, by the *Fundamenta Botanica*, N° 230, not to form, in the vegetable kingdom, any generical terms, synonymous to such as were employed in zoology or mineralogy.

C H A P. 21.

Poetical botanists—Cowley—Account of his poems on plants—Not deeply versed in the botany of his time—Intimate knowledge of natural history necessary to accomplish “the poet of nature.”

C O W L E Y.

IN all times, from VIRGIL and ÆMILIUS MACER of the Augustan age, from the spurious MACER, and STRABUS the monk of *St. Gall*, in the twelfth century, to modern times, the beauties of flowers, and the virtues of plants, have been celebrated in verse. *Marcus NÆVIANUS*, first a physician, and then a priest, of *Flanders*, sung the qualities of plants in his “*Poemation*” of 1563; and *THUANUS*, the great historian, amused himself with praising the *violet* and the *lily* in metre. In our own country, in 1723, *George KNOWLES* described 400 plants of the *Materia Medica*, in *Latin* verse, and didactically applied them to their uses in medicine.

But to proceed: That *England* and *France*,
in

in the same age, might not want their botanical laureats, COWLEY in the one, and RAPIN in the other, arose to celebrate this theme.

COWLEY, after having found reasons for studying physic, "considering botany," as we are told by his late eminent biographer, "as necessary to a physician, retired into *Kent*, to gather plants."

Here, he wrote, before the Restoration, his "Two first Books on Plants;" although they were not published till the year 1662. The remaining four were added in the edition of 1668; and the whole were republished, with other poems, in 1678. 8°. pp. 343.

In the *first* book, he celebrates the powers of various medicinal herbs, more especially of those which gave ampler scope to his muse, from antient renown of their virtue, and were yet in frequent use, and high esteem. Such were betony, wormwood, water lily, misseltoe, and various others.

In the *second*, he invokes the goddesses *Luna*, *Lucina*, *Jana*, and *Mena*; and sings the praises of simples appropriated to the diseases

diseases of the sex: in which, both antient superstition, and modern belief, supplied his muse with exuberant sources of gratification.

In the *third*, *Flora* calls forth all his powers, in the narcissus, the anemone, the violet, and the tulip, with a variety of other ornaments of the parterre, from the *coronary* tribe.

In the *fourth*, a more numerous set of the subordinate embellishments of the garden are recorded, in various measure; among which, the attributes of the moly, the lily, poppy, sunflower, saffron, and amaranth, attract his muse with more than ordinary attention.

In the *fifth*, he celebrates, in heroic measure, the gifts of *Pomona*, from the native products of *England*, to the date of the east, and the *tuna* of the west; terminating his poem with near two hundred lines on *Columbus*, on the *Spaniards*, on the new continent, and in expressing his hopes that, to the devastations of conquest, will soon succeed peace, religion, arts, and science.

In the *last*, he displays the sylvan scene,
from

from the oak of *Boscobel*, to the lowly juniper; and, having constituted his druidical monarch the sovereign of the forest, he makes him the oracle for a train of reflections, on the usurpation; the exile of *Charles the Second*, his restoration; and the *Dutch war*.

His poems are accompanied by notes, illustrating the etymology, the names, synonyms, descriptions, faculties, and uses of the plants, confirmed by authorities drawn from classical, botanical, and medical writers. Of these, he professes in his preface, that *PLINY* among the antients, and *FERNELIUS* among the moderns, have been his chief resources. Of botanical authors, *GERARD* and *PARKINSON* are sparingly mentioned, and they are the principal of that class.

Great eminence in science is seldom attainable, unless its foundation be laid in a devotedness of mind to its object, in the early scene of life. *COWLEY* did not enter on the study of physic, till the middle age of man; and then, as is probable, not with interested views towards practice. Hence
it

it may fairly be presumed, that he satisfied himself with moderate acquisition. What was true of the whole, may by fair analogy be applicable to a particular branch of it. He had doubtless that portion of knowledge in the *materia medica* of plants, which may be considered as adequate to the usual demand.

But, that COWLEY, in his retirement, should obtain an extensive and critical knowledge of botany, as it stood as a science, even in his day, could not be expected. His fervid genius could scarcely stoop to that patient investigation of nature, by which alone it could be acquired. Neither do the text, nor the notes, manifest sufficient proof of his intimate acquaintance with those authors of true fame, among the moderns, through whose assistance the want of that information might, in some measure, have been supplied.

Nevertheless, as, in the language of Dr. JOHNSON, “ Botany, in the mind of COWLEY, turned into poetry,” to those who are alike enamoured with the charms of both, the poems of COWLEY must yield
delight ;

delight; since his fertile imagination has adorned his subject with all the beautiful allusions that antient poets and mythologists could supply; and even the fancies of the modern *Signatores*, of BAPTISTA PORTA, CROLLIUS, and their disciples, who saw the virtues of plants in the physiognomy, or agreement in colour or external forms, with the parts of the human body, assisted to embellish his verse. Nor did he fail, by these elegant productions, to honour his subject, his name, and his country.

I close these observations by remarking, that poetry, as it ever hath, so it ever must derive from nature some of its most pleasing scenes of entertainment. In the vegetable world, the most expanded imagination of poetic genius will, even without the aid of fiction, so emphatically stiled the soul of poetry, find a field sufficiently ample for the display of the brightest talents. THOMSON witnesses this truth, while in him we lament the want of that botanical knowledge, without which, the poet must ever be deprived of numberless sources of the
most

most beautiful imagery, and such as would add peculiar grace, and the most instructive power to his muse.

And, although the talent of the poet hath not often been united to that of the really scientific botanist, there are not wanting instances of this union. I might mention, since the discovery of the sexes of plants, the ode, dedicated to CAMERARIUS, and printed in his "*Epistola de Sexu Plantarum*;" of which, a translation by Dr. MARTYN, when a young man, may be seen in BLAIR's "*Botanick Essays*." Professor VAN ROYEN, in 1732, published an elegant poem "*De Plantarum Amoribus, et Connubiis*." And CUNO, an ingenious merchant of *Amsterdam*, in a volume of 256 pages, described, in 1750, the plants of his own garden in verse; for which he received the laurel from LINNÆUS, by a new genus inscribed to his name.

Whilst I am now writing, I have the pleasure of congratulating all those, whose love of poetry is aided by a taste for botanical science, on a most elegant production in

our

our own country. The beautiful display of the principles of the *Linnæan* system in the "Botanic Garden," under the delicate analogy of the "Loves of the Plants," in which the didactic design of the author, is so happily embellished by *Ovidian* imagery, as to have given that energy and ornament to the subject, which has been hitherto wanting to all similar productions in the *English* language.

C H A P. 22.

Merret, *brief anecdotes of*—His *Pinax Rerum Naturalium*, intended to supply the deficiencies of *How's Phytologia*—*Assisted by Willisel: Goodyer's manuscripts*—*Merret's other writings*—His *papers in the Philosophical Transactions*.

M E R R E T.

“ **C**HRISTOPHER, the son of *Christopher* M E R R E T, was born at
 “ *Winchcombe*, in *Gloucestershire*, Feb. 16,
 “ 1614. He became a student in *Gloucester*
 “ *Hall*, in the beginning of the year
 “ 1631; two years after which time, he
 “ translated himself to *Oriel College*, and
 “ took the degree of B. A. in 1634. Afterwards, retiring again to *Gloucester*
 “ *Hall*, he applied to the study of *physic*,
 “ and was created doctor in that faculty in
 “ 1642. About this time he settled in
 “ *London*, and came into considerable practice, was a fellow of the College of
 “ *Physicians*, and of the *Royal Society*.
 “ He

“ He died at his house, near the chapel in
 “ *Hatton Garden*, in *Holborne*, near *London*,
 “ Aug. 19, 1695 ; and was buried twelve
 “ feet deep in the church of *St. Andrew's*,
 “ *Holborne*.” Thus far Mr. *Wood*.

The publication which entitles Dr. *Merret* to a place in these anecdotes, is, his
 “ PINAX RERUM NATURALIUM BRI-
 TANNICARUM, *continens* VEGETABILIA,
Animalia, et Fossilia, in hac Insula reperta.”
 8°. 1667. pp. 223.

This is not noticed in the title as a second edition, although there is one recorded by authors, with the date of 1665. However, I suspect it to be a mistake, as no such edition is quoted by RAY. He dates his book from the College of Physicians, and is mentioned by MORISON under the title of “ *Musei Herbiani Custos.*”

Dr. MERRET informs us, that he undertook this work at the request of a bookseller, to supply the deficiencies of How's “ *Phytologia*,” after that work was out of print ; and that it was intended to have been done jointly with Dr. DALE, whose death, soon after the design was formed,

threw the whole into his own hands. He says, he had purchased 800 figures, which JOHNSON had caused to be engraved, with which the work was to have been embellished. Why they did not appear, no cause is assigned; nor do I find any further notices of them. Dr. MERRET, though unquestionably a man of learning, taste, and considerable information in natural history, seems to have engaged in it too late in life, to admit of his making that proficiency, which the design required. Add to this, that being fixed in *London*, and closely engaged in the practice of his profession, he was rendered incapable of investigating plants, in the distant parts of the kingdom. He however engaged *Thomas WILLISEL* to travel for him; and he tells us, that WILLISEL was employed by him for five successive summers. His son, *Christopher MERRET*, also made excursions for the same purpose; and Mr. *Tauldon GOODYER* furnished him with the manuscripts of his grandfather. By these assistances Dr. MERRET procured a large number of *English* plants, and a knowledge of the *Loci Natales*.

Never-

Nevertheless, he was not possessed of that critical and intimate acquaintance with the subject, which might have enabled him to distinguish, with sufficient accuracy, the species from varieties. He ranges the plants alphabetically, according to the *Latin* names, and has given few synonyms, except those of GERARD and PARKINSON; to which, after the example of the writers of the "*Hortus Oxoniensis*," he has very commendably annexed the page. He gives the general places of growth, and specifies the particular spots, where the rare plants are found.

At the end of the Catalogue, is subjoined, a rude disposition of vegetables into classes, somewhat like that of *John* BAUHINE. This he hoped to have improved, against the time of a second edition, which, probably, Mr. RAY's publications superseded. Then follows a brief *Synopsis Etymologica*, and a useful list of the plants as they flower in each month, pointing out the duration of the time. Dr. MERRET has, in this *Pinnax*, introduced many plants as new, which, on subsequent examination, proved to be

only varieties ; a number of exotics, evidently the accidental offspring of gardens, and many that could never be met with by succeeding botanists, in the places specified by him. He enumerates upwards of 1400 species of *English* plants ; whilst the accurate Mr. RAY, only three years afterwards, confines the number to 1050. Nevertheless, several *British* plants make their first appearance in this *Pinax* ; and Dr. MERRET would probably have secured his title to some others, if he had not totally omitted to give descriptions of those which he introduces as new.

The zoological part of this *Pinax* is extremely superficial ; consisting merely of the *Latin* and *English* name, with a reference to ALDROVANDUS, GESNER, JOHNSTON, and MOUFFETT. The mineralogy is not less brief, and imperfect.

Before the publication of this work, Dr. MERRET had printed “ A Collection of
“ Acts of Parliament, Charters, Trials at
“ Law, and Judges Opinions, concerning
“ those Grants to the College of Physicians.” 4°. 1660. This became the basis,

fis, as Mr. *Wood* says, of Dr. GOODALL's book, printed in 1684.

In 1669, he wrote "A short View of
" the Frauds and Abuses committed by
" Apothecaries, in relation to Patients, and
" Physicians." 4°. This treatise engaged
him in a controversy with the famous
Henry STUBBE. It may be presumed, that
all discussions of this kind, howsoever well
meant, can have but little effect in reform-
ing the abuses hinted at, while the custo-
mary and legal constitution, and polity of
physic, remain in the present state in *Great
Britain*.

In 1662, he translated into *English*, "The
" Art of Glafs; how to colour Glafs, Ena-
" mels, Lakes, &c." 8°. written by *Ant. NE-
RI*, accompanied with an account of the Glafs
Drofs. And, in 1686, the same work was
published in *Latin*, with Dr. MERRET'S
" Observations and Notes," equal in extent
to the work itself. *Amst.* 12°.

Mr. *Wood* informs us, that he also print-
ed, in one sheet, 4°. "The Character of a
" compleat Physician or Naturalist."

Dr. MERRET was among the earliest

members of the Royal Society, after its incorporation; and contributed several papers, which were printed in the "*Philosophical Transactions*."

He made experiments on vegetation, in the year 1664; by which he found, that square sections of the bark, from ash, and maple, whether separated on three sides only, or wholly, would firmly unite, if tightly secured by plaister and packthread.

Experiments on the loss of weight, which a plant of the *Aloe Americana*, with eleven leaves, suffered by hanging up in the kitchen for five years. In the first year it lost near two ounces and an half; the second upwards of three ounces; decreasing afterwards nearly in the same proportion. It lost two of the larger leaves every year, and put forth two new ones every spring; from which circumstance, the Doctor inferred a circulation of the juice.

Experiments on cherry-trees, that, having withered fruit, occasioned by the sun being admitted too suddenly upon them in March, recovered, by daily watering the roots.

Observations

Observations on the *London* granaries. These four papers were all printed in N° 25, in the second volume of the “*Transactions.*”

In N° 138, an account of the tin-mines in *Cornwall*, mundic, spar, and *Cornish* crystals.

In N° 142, an account of the art of refining, in the several methods, by parting, by the test, the almond furnace, and by mercury.

In N° 223, some curious observations on the fens of *Lincolnshire*; on the animal and vegetable produce: a description of *Boston* church, the incroachments of the sea, and other particulars, which must have rendered this paper a very interesting morsel of natural history. He gives a list of several of the more rare plants growing in the fens.

In N° 224, a table of the washes called *Fosdyke* and *Crosskeys*, in *Lincolnshire*, specifying the times of high water, and safe passage over the sands.

C H A P. 23.

Morison—*Account of his life*—His Hortus Ble-sensis; in which are contained the rudiments of his system, and the animadversions on the Bauhines—*Publishes* Boccone's Plantæ Siculæ—His Distributio Plantarum Umbelliferarum—His great work, the Historia Plantarum Oxoniensis—*Outlines of his method.*
 Jacob Bobart, the continuator of Morison's History—*Brief anecdotes of.*

M O R I S O N.

ROBERT MORISON was born at *Aberdeen*, in 1620; was educated in the same university; and, in 1638, took the degree of doctor in philosophy, equivalent to that of M. A. He first applied to mathematics, and was designed by his parents for the theological line; but his taste for botany and physic superseded their intentions. His attachment to the royal cause, led him into the army; and he received a dangerous wound in the head, in the battle at *Brigg*,
 near

near *Aberdeen*. Upon his recovery, he went to *Paris*, the asylum of his countrymen. Here he was first employed as a tutor to the son of a counsellor, *Bizet*; and, in the mean time, assiduously applied to the study of anatomy, botany, and zoology. In 1648, he took the doctor's degree in physic at *Angers*. He became so much distinguished by his skill in botany, that at the recommendation of M. ROBINS, the king's botanist, he was taken into the patronage of the Duke of *Orleans*, uncle to *Lewis XIV.* and appointed intendant of his fine garden at *Blois*, with a handsome salary. This establishment took place in 1650, and he held it until the death of the Duke, in 1660. Here, we are told, MORISON laid open to the Duke his method of botany; and was liberally encouraged by him to prosecute it. The Duke also sent him into various provinces of *France*, to search for new plants. He travelled into *Burgundy*, the *Lyonnois*, and *Languedoc*; and into *Britanny*, the coasts and isles of which he carefully investigated; and, by these journies, enriched the garden with many rare, and some new plants.

It

It was in this situation that he became known to *Charles II.* who, in 1660, on the death of his uncle the Duke, invited MORISON into *England*; and, although solicited by the treasurer *Fouquet*, on the most honourable and ample conditions, to remain in *France*, the love of his country overcame all temptations, and he returned to *England*. *Charles II.* gave him the title of king's physician, and royal professor of botany, with an appointment of 200*l.* a year, and a house, as superintendant of the royal gardens. He was elected fellow of the Royal College of Physicians, and acquired much fame for his knowledge of botany. In this situation he remained till the year 1669, when, having made an acquaintance with Mr. *Obadiab WALKER*, of University College, with the Dean of Christ Church, and other leading men of the university, he was, by their interest, elected botanic professor at Oxford, Dec. 16, 1669, and incorporated doctor of physic the day following. He read his first lecture in the physic school in September 1670, and then removed to the physic garden, where he lectured

lectured three times a week, to a considerable audience. In this occupation, and in conducting his great work, the "*Historia Plantarum Oxoniensis*," he laboured to the time of his death, which was thought to have been occasioned by a bruise, received by the pole of a coach, in crossing the street, Nov. 9, 1683. He died at his house in *Green-street, Leicester Fields*, the next day, and was buried in the church of *St. Martin's in the Fields, Westminster*.

SEGUIER seems to have placed improperly among MORISON'S works the first edition of the "*Hortus Blefensis*," which he gives as published in the year 1635, when MORISON must have been only fifteen years of age. This may have been a typographical error; but the book, in fact, was the work of *Abel BRUYNER*, physician to the Duke of *Orleans*, and was not published till 1653. MORISON'S first publication was a second edition of this catalogue, under the following title: "*HORTUS REGIUS BLESENSIS auctus: accessit Index Plantarum in Horto contentarum nemini Scriptarum et Observa-*"

Observationes generaliores, seu Præludiorum pars prior." Lond. 1669. 12°.

The "HORTUS BLESENSIS" raised the author's character, and contributed, as the writer of his life observes, to recommend him to the station he afterwards held at *Oxford*. It contains the rudiments of his method of classification. He professes to give a list of 260 new plants; but many of them proved to be only varieties, and others, such as were well known before. There were, nevertheless, some new and rare plants, of exotic, as well as indigenous origin; the latter, such as he had himself first discovered in *France*.

In this work is also given his "HALLUCINATIONES in CASPARI BAUHINI *Pinacem, tam in digerendis quam denominandis Plantis; et his Animadversiones, in tres Tomos, Historiæ Plantarum* JOHANNIS BAUHINI;" a work which *Haller* calls "*Invidiosum Opus*;" and which, while it proves both the accuracy and diligence of the author, must be confessed to be unbecomingly severe on these two illustrious writers; who,

as

as they did not profess to write a system, are here too rigidly tried by rules, not invented when they wrote, and of consequence the validity of which they could not have acknowledged.

In a dialogue at the end of the "*Hortus Blefensis*," MORISON teaches, that the genera of plants should be established on characters drawn from the fruit, and not on any sensible qualities, or supposed medicinal virtue. He also learnedly defends the doctrine, that all vegetables arise from seed; a proposition not universally allowed; the doctrine of equivocal, or spontaneous generation, having, at that time, many advocates among the learned.

Dr. MORISON, during his residence in France, in his occasional journies to Paris, about the year 1658, became familiar in the family of Lord HATTON, then resident at St. Germain's, and whose second son Charles was much attached to natural history, and became a voluntary and zealous disciple of our author. Sixteen years afterwards, Mr. Charles HATTON sent over, at the author's request, a treatise, with the plates already engraved,

graved, written by *Paul Boccone*, on plants, discovered by him in the southern parts of *Europe*, principally in *Sicily*, of which some were rare, and some new. *Boccone* was originally of *Savona*, in the *Genoese* district; and was born in 1633. He became a *Cistercian* monk of *Palermo*, and was a man of singular and various erudition in natural history. He visited *Corfica* and *Malta*; travelled into *England*, *Holland*, and *Germany*; and was for some time botanist to the Duke of *Tuscany*. He was the author of several very curious works; and died in 1704. He wrote on fossils; but his botanical writings have greater originality, and were of high value. *Morison*, after having caused the seven last plates to be re-engraved, published the work alluded to above, under the following title:

“*ICONES et DESCRIPTIONES RARIORUM PLANTARUM Melitæ, Galliæ, et Italiæ. Auctore Paulo Boccone, panormitano siculo, serenissimi magni Etruriæ Ducis olim Botanico.*” Oxon. 1674. 4°. pp. 96. t. 52. fig. 119.

Morison prefixed to this work a dedication

cation to Mr. HATTON, in which he defends, not only the doctrine in general, that all plants spring from seed, but particularly, against DIOSCORIDES, and some of the restorers of science, among whom were CÆSALPINUS, that all the ferns are furnished with flowers and seed.

The plants described and figured in this book, are, most of them, such as had not been noticed by foregoing authors. A few of these are common to *Britain*. The figures are small, and neither well delineated, nor well engraven: but the work had its use, as containing some plants of Southern *Europe*, not to be met with in any other author; and on this account derives some value, to those who are curious in pursuing the history of plants in the sexual system, as being quoted by LINNÆUS.

As a specimen of his great work, meditated under the name of "*Historia Plantarum Universalis Oxoniensis*," MORISON next published, "*PLANTARUM UMBELLIFERARUM DISTRIBUTIO NOVA, per tabulas cognationis et affinitatis, ex libro Naturæ observata et detecta.*" Oxon. 1672. fol.

pp. 91. t. 12. The umbelliferous tribe is here divided into nine orders, the genera of which are distinguished by the figure of the seed, assisted, in some of the subdivisions, by the form of the leaf. They are illustrated by figures of 150 different seeds.

The author has subjoined what he names "Umbelliferous Plants, improperly so called." Such are *Valeriana*, *Thalictrum*, *Filipendula*, *Valeriana græca*, *Pimpinella Sanguisorba*; all which are very different, both in character and habit, except the *Valerian*, from the natural class of which he treats.

This specimen excited the attention of the learned, augmented MORISON's patronage, both abroad and at home; and encouraged him to prosecute with vigour his great work, of which the first volume came out under the following title: "PLANTARUM HISTORIÆ UNIVERSALIS OXONIENSIS, *Pars secunda; seu Herbarum-Distributio nova, per tabulas cognationis et affinitatis, ex libro Naturæ observata et detecta.*" Fol. 1680. pp. 617. The first part of the History, on Trees and Shrubs, was never printed. Some have doubted, whether it

was

was ever written; but SCHELHAMMER* tells us, that he saw the whole work perfect in the hands of the author. MORISON himself assigns, as a reason for publishing the Herbaceous Division first, the greater magnitude of the undertaking, arising from the vast number, and consequent difficulty of finding proper distinctions and characters; and because he was unwilling to leave the most difficult and abstruse part of his work behind him unfinished, as happened to DELECHAMP, and John BAUHINE. Unhappily, however, MORISON's untimely death subjected his work to the same lot, and did not allow him to finish more than nine, out of the fifteen classes of his own system.

He divides all herbaceous plants into fifteen classes, under the following titles :

- | | |
|-------------------------------------|----------------------------------|
| 1. <i>Scandentes.</i> | 7. <i>Papposæ Laefcescentes.</i> |
| 2. <i>Leguminosæ.</i> | |
| 3. <i>Siliquosæ.</i> | 8. <i>Culmiferæ.</i> |
| 4. <i>Tricapsulares Hexapetalæ.</i> | 9. <i>Umbelliferæ.</i> |
| 5. <i>Tricapsulares, aliæ.</i> | 10. <i>Tricocæ Purgatrices.</i> |
| 6. <i>Corymbiferæ.</i> | |

* In additamentis ad CONRINGIUM.

- | | |
|--|------------------------|
| 11. <i>Galeatæ, et Verticillatæ.</i> | 13. <i>Bacciferæ.</i> |
| 12. <i>Multifiliquæ, et Multicapsulares.</i> | 14. <i>Capillares.</i> |
| | 15. <i>Anomalæ.</i> |

From an inspection of this table, it appears, that his method is not uniformly founded on the fruit ; in fact, much less so than that of CÆSALPINUS ; but on the fruit and the habit conjointly ; since the *Corymbiferæ, Umbelliferæ, and Galeatæ*, with the *Verticillatæ*, arise from the disposition of the flower ; the *Scandentes, Culmiferæ, and Capillares*, from the habit : the seventh class from the qualities partly, and partly from the seed. Hence we see, that only half the classes are founded on the fruit ; the fifteenth being truly an heteroclite assemblage. His method would have approached much nearer to perfection, on his own principles, had he enlarged the number of his classes ; since, in several instances, they embrace natural orders, much too distinct to be ranged together. The orders, or subdivisions of the classes, are, in some instances, grounded on differences in the seed-

seed-vessel ; in others, on the root, habit, and frequently on less scientific discriminations. In the conduct of the work itself, MORISON makes a separate chapter for each genus. He begins by referring to the antients under each plant ; frequently subjoining the etymology. The generical characters, if indeed they can be so called, are very vague ; and though taken from the parts of fructification, are, too often, assisted by distinctions from the root, leaves, and mode of growth. After the generical note, follows a synoptical table of the species, referring to the plates. The descriptions are sometimes borrowed from *John* BAUHINE and others. To most of the plants, he affixes new specific characters, and subjoins the *synonyma* of several authors. He introduces, at the end of the chapters, the animadversions on the BAUHINES, and an account of the virtues and uses of the plants.

The five first classes only, were published by the author, who left the four succeeding ones finished. These, with the remaining classes, were finished and published, after an interval of nineteen years, by *Jacob* BO-

BART. MORISON had the advantage of powerful patronage. He was liberally encouraged by the university, and enabled to embellish his work with a numerous set of tables, on which are engraven about 3384 plants. The figures are chiefly copied from other authors. The new figures occur principally in the latter part of this work, and are therefore to be attributed to the care of BOBART. The six tables of *Mosses*, *Fuci*, *Corallines*, and *Corals*, at the end, are, except the few wooden cuts of GERARD, the first of the kind graved in *England*, and have great merit as the productions of that time. All those of COLUMNA and CORNUTUS are copied in this work. Those engraved by *Burghers* excel the rest; and the figures of the grasses and mosses are incomparably beyond any other that are to be met with, on the same scale; the habit being admirably well expressed. The republication of these tables, with references to LINNÆUS's writings, would, even at this period, be a benefit to the science.

The third part, or, more properly, the second volume of the "Oxford History of
"Plants,"

“ Plants,” was published by *Jacob BOBART*, in fol. 1699. pp. 655. A life of *MORISON* is prefixed to this volume, and an engraving of him done by *White*, with *Dr. PITCAIRN*’s Tetraëtic underneath. In the preface, which is signed *Jacob BOBART*, the reader is presented with a general view of the writers on botany, from *THEOPHRASTUS*, to the time of *MORISON*; enumerating throughout the several nations of *Europe*, in a chronological order, the most learned authors on the subject. The writer then informs us of the patronage and encouragement which *MORISON* received from the university, to undertake this work; and, after lamenting the untimely death of the author, and expressing his grateful sense of the honour he received in being appointed to continue the undertaking, he lays before the reader the assistances he received in the prosecution of it. An interval of near twenty years had given *BOBART* an opportunity of inserting a great number of plants unknown to *MORISON*, from the works of *RAY*, *HERMAN*, *PLUKENET*, the “ *Hortus Malabaricus*,” and other works.

With respect to *English* botany, great communications had been made by SLOANE, PETIVER, DOODY, SHERARD, and others. By these means, this volume contains nearly double the number of the former ; but the latter part of it proves, too evidently, that it did not receive the finishing hand of the original author ; since it appears in a very abridged form, compared with what MORISON * himself had done.

BOBART.

Jacob BOBART, the continuator of MORISON's History, was the son of *Jacob*, the first superintendant of the Garden, upon its foundation in 1632. Both the father and son filled their station with great credit to themselves, and no less emolument to the Garden. The elder is said to have been the author of the first edition of the "*Hortus Oxoniensis*," 1648 ; and his name is joined in the second edition, 1658, as an associate in the work, with Dr. STEPHENS and Mr.

* The name of MORISON is perpetuated by PLUMIER, in the application of it to a West India tree of the *monadelphous* class, hitherto described only by himself and JACQUIN.

BROWNE. Mr. GRANGER relates a humorous circumstance in his manners; that “on
“ rejoycing days, he used to have his beard
“ tagged with silver.” He died in 1679,
at the age of eighty-one; and left, besides
Jacob, another son, named *Tillemant*, who
was also employed in the Physic Garden.

I cannot ascertain the time of BOBART’S death; but from the story related of him by Dr. Grey, in his edition of “*Hudibras* *,” he must have been living in 1704. He had transformed a dead rat into the feigned figure of a dragon, which imposed upon the learned so far, that “several fine copies of verses were wrote on
“ so rare a subject.” BOBART afterwards owned the cheat; but it was preserved for some years, as a master-piece of art. There is a print of the elder BOBART, with a distich, dated 1675, by *Burghers*; which confirms his German origin; but it is very scarce †.

* Part I. Canto ii. l. 314.

† The name of BOBARTIA was given by LINNÆUS to a plant of the *graminaceous* tribe, which he first discovered in HERMAN’S collection of the plants of *Zeylon*.

C H A P. 24.

A short history of the rise and progress of system, method, or classification of plants; from its origin to its revival in England—General state of arrangements before GESNER and CÆSALPINE—RAY and MORISON both laboured in the revival of method at the same time—Advantages of system—Various methods of classification enumerated.

M E T H O D.

A GREEABLY to my purpose, I now proceed to give a concise account of the rise and progress of what is understood by *method, system, or classification* of plants, arising from agreement in the parts of fructification, independent of any association from the *facies externa*, or habit of the plant. To this, I shall add as brief an history of another important discovery, that of the *sexes of plants*; in consequence of which, system itself has been carried to a much higher degree of perfection.

There are no traces of what the moderns
call

call *system*, in the writings of the antients ; by whom are pre-eminently signified, THEOPHRASTUS, DIOSCORIDES, and PLINY. Their knowledge of vegetables was confined to a few that were used in medicine, and in the arts and conveniences of life ; and in treating on them, their subjects are placed in great and inordinate divisions, without the smallest approach to what is now meant by *classification*.

THEOPHRASTUS treats his subject, in general, philosophically. In his book "*De Causis Plantarum*," he considers the propagation, culture, qualities, and uses of Plants in general ; but describes very few. In his "*Historia Plantarum*," in which are described, or enumerated, about 500 species, he begins with the organization, the generation, and propagation of Vegetables: He then treats largely, in his *third* and *fourth* books, on Trees. In the *fifth*, on Timber, and the choice of the best. In the *sixth*, on Shrubs, thorny Plants, Roses, and other ornaments of gardens. In the *seventh*, on oleraceous Plants, and wild Plants. In the *eighth*, copiously on Grain of all kinds.

And

And in the *last*, on Gums, Exudations, and the methods of obtaining them.

The object of DIOSCORIDES being solely the *Materia Medica*, he discusses each subject specifically, and in a separate chapter, dividing the whole into five books; in which, as far as any order takes place, they arrange into aromatic, alimentary, and medicinal plants. His descriptions are taken chiefly from colour, size, mode of growing, comparison of the leaves and roots, with other plants well known, and therefore left undescribed. In general they are short, and frequently insufficient to determine the species. Hence arose the endless, and irreconcilable contentions, among the commentators. In this manner he has described near 700 plants; to which he subjoins the virtues and uses. To DIOSCORIDES all posterity have appealed as decisive on the subject.

PLINY, who treats of plants from the twelfth to the twenty-seventh book, inclusive, of his "History," has drawn his resources principally from Grecian authors. He is the historian of antient botany, and recites the names of several hundreds, not mentioned

mentioned by foregoing writers ; but many of these are unknown. There is no scientific order in the disposition of his subject ; and the great value of PLINY's work consists in having preserved to us the remains of antient knowledge on the subject ; and in particular, the application of it to the arts of life, in those remote times.

After the revival of learning in the fifteenth century, the first cultivators of botany studied plants more in the writings of these fathers, than in the book of nature ; and were solely anxious about extricating the plants of the *Materia Medica* ; scarcely adverting to those striking discriminations in the general port, mein, or habit, the mode of growing, and other obvious relations, which mark the great natural families in the vegetable kingdom : but were content to arrange them, some, according to the alphabetical nomenclature, others, from the structure of the root, the time of flowering, the places of growth, the supposed qualities, and uses in medicine ; or from other as unstable distinctions. With them, as with the antients, there were nearly as many genera

vera as *species*; and if they gave the same common appellation to two, or more plants, they were led to it by some rude, external resemblance; such as, size, form of the root, agreement in the colour of the flower; and, in the description of the species, were frequently satisfied with comparing it to another plant well known to themselves, and therefore left undescribed in their writings.

This mode of arrangement, though in a somewhat improved state, is exemplified above, in the order observed by DODONÆUS; and is seen in our old *English* herbalists, GERARD and PARKINSON.

LOBEL, in his *Adversaria*, 1570, seems to have been the first, who attempted to distribute plants into large families, or classes, from the general consent of habit, or external form, and mode of growing. This he has done in an imperfect synoptical way; and several of his families contain natural orders, or classes, nearly entire; but frequently interrupted by great anomalies. His arrangement was not sufficiently attended to at the time: it was then excellent, and was gradually improved, until we see it in
its

its last, and best form, as exhibited by *Caspar* BAUHINE, in his *Pinax*, 1623; and especially by *John* BAUHINE, in his *Historia Plantarum Universalis*, 1650.

As natural characters arose from similarity in the general port, or habit of the plant, and from an obvious agreement in the disposition of the stalk, leaves, stems; and from that of the flower, fruit, and seed; so, they at length forced themselves to observation. Thus, the general habit of all *grasses*; the plants with a *papilionaceous* flower, such as pease and vetches; the *siliquose* plants, such as mustard, cresses, turneps, &c.; the *verticillated*, as mint, baum, hyssop, germander, &c.; the *umbellated* tribe, parsley, carrots, hemlock, angelica; the *cone-bearing trees*; and several other tribes, were too striking, not to be seen even by a superficial observer. But, as these constitute only a part of the whole, so no characters were formed for those plants, which the eye could not immediately refer to some of these classes. Still less had any generical agreement, arising from uniformity in the fructification, been detected. Had all the species of plants arranged themselves under
natural

natural classes, a natural method would easily have followed ; but the intermediate links, notwithstanding the efforts of the most skilful, are yet unknown. Hence arose the necessity of artificial systems, which are now become but too numerous. Some have imagined, that the more pure any artificial system preserves the natural classes, the greater is its excellence ; but experience does not confirm this idea. Those arrangements are found to lead more immediately to the plant sought for, the classes and subdivisions of which are simple, and drawn each uniformly from the same parts of the fructification.

Conrad GESNER, the LINNÆUS of the age in which he lived, is universally agreed to have been the first who suggested this true principle of classical distinction, and generical character, as is manifest from various passages in the *Epistles* of that great man *. He instances the agreement of the *Staphisagria*, with the *Consolida* ; the *Scorzonera*, with the *Tragopogon* ; the *Molucca*, with the *Lamium* ; the *Dulcamara*, with

* *Epist. Medicinal.* à *Wolphio* ed. p. 113, et passim.

the *Solanum*; the *Calceolus*, with the *Orchides*: and he expressly says, that the character should be formed from the flower, and the seed, rather than from the leaves. This was in the year 1565. Other passages occur, by which it appears, he had the same ideas so early as 1559. But, perhaps, there is no proof of the importance he gave to these parts, more indubitable, than his having been the first who delineated them separately, with the figures of his plants; of which numerous instances may be seen in the tables published by SCHMIEDEL.

BUT GESNER did not live to improve the hints he thus drew from nature; and, what is wonderful, they were neglected by those great luminaries of the science, CLUSIUS, and the BAUHINES. It was reserved for CÆSALPINUS, a man in whom was united an exquisite knowledge of plants, with a truly philosophical genius. He had been the disciple of GHINUS, and was afterwards physician to Pope *Clement VIII.* He described, with exquisite skill, the plants of his own country, and left an *Herbarium* of

768 species. He extended GESNER's idea, and commenced the period of systematic arrangement. In his "*Libri xvi de Plantis*," published 1583, he has arranged upwards of 800 plants into *classes*, founded, after the general division of the trees from herbs, on characters drawn from the fruit particularly, from the number of the capsules and cells; the number, shape, and disposition of the seeds; and from the situation of the *corculum*, *radicle*, or eye of the seed, which he raised to great estimation. The *orders*, or subdivisions, are formed on still more various relations.

Fabius COLUMNA improved this doctrine of *classification*, in 1616, by extending it to the formation of *genera*, which CÆSALPINUS had not effected; all his species being separately described. COLUMNA, indeed, did not exhibit a system; but he shewed the way to complete it, by the union of species under one common name, from similarity in the flower, and fruit; and he invented several of the terms, now in use, to denominate those parts. This noble invention, nevertheless,

nevertheless, lay dormant for near a century; and the glory of reviving, and improving it, was reserved for *Britain*.

RAY, and MORISON, both laboured in it at the same time; and with them must commence the æra of systematic botany in *England*. It was an object thought worth contending for, and each of these writers had their partizans, who respectively bestowed the laurel, as they were led by their various motives, or attachments. I shall not enter into the merits of their claims, further than to observe, that both seem to have turned their attention to the subject, nearly about the same time, and that Mr. RAY had certainly priority in point of publication, if it may be allowed, that the tables which he drew up for Bishop WILKINS's "Real or Universal Character," which was published in 1668, contain the outlines of a system. And, certainly, these rudiments, though hastily done, as Mr. RAY confesses, sufficiently prove that he had bestowed no small attention on the subject. That foreign writers have more commonly attributed to MORISON the revival of me-

thod, may have arisen from their being less acquainted with Bishop WILKINS's work, which was extant only in the *English* tongue. Mr. RAY informs us, in the second edition of his *Catalogus Plantarum Angliæ*, that Dr. WILKINS meditated a translation of his "Universal Character" into *Latin*, with figures, for the use of foreigners; and Mr. RAY himself performed it: but the death of this good prelate, in 1672, prevented the completion of the design. He adds, that his Method, in a more elaborate state, had been delivered into the Bishop's hands, for the above-mentioned work.

Dr. MORISON exhibited the outlines of his scheme in the "*Hortus Blefensis*," the year after the publication of the Bishop's book, and exemplified it in his "History of "Plants," in 1680. Mr. RAY did not detail his till the year 1682, in the "*Methodus*," in which he freely acknowledges the assistance he received from CÆSALPINUS, COLUMNA, JUNGIUS, and even from MORISON's work. On the contrary, Dr. MORISON assumes to himself the merit of having drawn all his resources, in the fabrication

brication of his system, wholly from nature, and his own observations ; preserving every where the utmost silence, respecting any assistance derived from former writers. Assumptions, which could with difficulty be acceded to, and which drew upon him the censures of TOURNEFORT, and other masters of the science ; who were well acquainted with the fountains of knowledge that were then open to him, and the assistances he must have drawn from GESNER, CÆSALPINUS, and others.

At this distance of time, and under the present enlightened state of science, the systems of RAY, and of MORISON, must not be scrupulously examined. CÆSALPINUS laid a foundation-stone, on which, if our *British* architects raised a *Gothic* structure, their successors have improved it to a style of greater symmetry, and elegance.

The introduction of *system* was fortunate for science, as it brought with it, by degrees, the establishment of generical characters, on a like assemblage of essential parts in several species. As new plants

were daily discovered in the old continent, and were pouring in from the new, the nomenclature of botany was in danger of being again overwhelmed, with that chaos in which *Caspar* BAUHINE found it, when he reduced it into some order, by his laborious and incomparable *Pinax*.

System enabled botanists to refer new species to *genera* already formed, and restrained that licence before taken, of giving a new generical appellation to each new plant: for, although in the multitude of methods which followed this discovery, plants of the same genus, in one system, were frequently referable to a different genus in another; yet, with this inconvenience annexed, they were more readily investigated, than under the vague distinctions of the older writers.

The restoration of *system*, was, in the words of LINNÆUS, the beginning of the golden age of botany; and the revival of it having taken place in *England*, presently raised up several learned men among us, who gave new life and vigour to the whole science. The names of SLOANE, PLUKET,
NET,

NET, SHERARD, and PETIVER, will ever remain illustrious in the annals of botanic knowledge. .

It also turned the attention of the learned on the continent to the subject. Rival systems were soon constructed; some on the *fruit*, as the basis of the classes, in conformity to the systems of CÆSALPINUS, RAY, and MORISON; and others, on the *flower*. Thus, *Christopher* KNAUT, in 1687, and HERMAN, in 1690, fixed on the *fruit*; whose systems were improved by BOERHAAVE, in 1710.

RIVINUS, in 1690, chose the *flower* alone; considering the *number* and *regularity* of the *petals*, as the base of his classical characters; and was followed by RUPPIUS in 1718, and LUDWIG in 1737. TOURNEFORT, who elaborated his *method* beyond his predecessors, in 1694, chose the *figure* of the *corolla*, as the principle of *classification*; and MAGNOL, in 1720, took the *calyx* alone.

If it should be enquired on this occasion, in what the *methods* of CÆSALPINUS, RAY, and MORISON, differ from the ar-

rangements used before their time, by DONÆUS, LOBEL, and *John* BAUHINE, since those also are established on the habit, and in which many of the natural classes are tolerably well preserved; it may be answered in a summary way, that habit, even in BAUHINE's order, the most perfect of them, is the prevailing principle, without regard to agreement in the parts of fructification, except in those classes, where nature has joined both together: this is a difference much more essential than may at first be apprehended: and, what is still less accurate than a regard to habit alone, some of their classes (if they are worthy of that appellation, no definitions of them being prefixed,) take their name merely from the mode of growing, as, *Scandentes*; from the structure of the leaf, *Nervifoliæ*; *Rotundifoliæ*; *Crassifoliæ*; place of growth, *Aquaticæ*; and what is still less eligible, the aspect, and supposed agreement in the qualities, such are, *Malignæ*; *Mollientes*; *Papavera*; under all of which, are promiscuously collected, plants as dissimilar as possible, in the structure of the flower and fruit.

C H A P. 25.

History of the discovery of the sexes of plants—The doctrine of the antients on this head—Their knowledge very limited—The universality of this process—The discovery of Millington and Grew—Subsequent writers, who have confirmed or opposed the doctrine—Present idea of it exhibited.

S E X O F P L A N T S.

TO the revival and establishment of *method*, succeeded a discovery of the highest importance to botanical science; I mean, what is, with great justice, called analogically, The doctrine of the *sexes* of plants; or, the knowledge that, throughout the vegetable kingdom, the influence of the dust of the *antheræ*, upon the *stigma*, was necessary in order to produce fertile seed. By the establishment of this fact, not only the physiology of vegetables was greatly advanced, but, in the end, practical botany equally improved; since, on this foundation has been built that system of the great
Swede,

Swede, which is now so universally followed. Of the rise and progress of this investigation, I proceed to give a concise account, before I pursue the sketch of *British* authors.

A vague and indecisive opinion concerning the *sexes* of plants, prevailed among the ancient philosophers of *Greece*. We are informed by ARISTOTLE, that EMPEDOCLES particularly taught, “ that the sexes “ were united in plants.” This opinion was a natural consequence of the doctrine which this philosopher, in common with ANAXAGORAS, DEMOCRITUS, and PLATO taught, “ that plants were sentient and “ animated beings.” This idea has met with ingenious advocates among the moderns, who have been induced to favour it, not only from the general analogy existing between animals and vegetables, and the difficulty of fixing the limits between them, but from the more striking instances of apparent irritability, and obedience to the action of certain *stimuli*: such are, the general affection plants have for light; the rotatory motion of many towards the sun; the faculty of others in closing the leaves
at

at night, called, not unaptly, the *sleep of plants*; and the opening and shutting of many flowers, at stated times, with equal propriety denominated *vigiliæ florum*; the rising of the flower of aquatic plants out of the water, every morning during the state of floescence, as instanced in the *Nymphæa*, and still more signally in the *Vallisneria*. To these may be added the more remarkable examples in the *Mimosa*, and *Oxalis sensitiva*, in the *Dionæa muscipula*, the *Drosera* and the *Hedysarum gyrans*, and finally, in the exquisite irritability of the *stamina*, and *antheræ*, in various species. EMPEDOCLES, nevertheless, though he maintained the doctrine of the *sexes*, does not attempt to confirm it by any facts, or reasonings deduced from the knowledge of the uses of the separate parts in flowers, but from analogical deduction, founded merely on his general doctrine.

ARISTOTLE, or rather the author of the *Books on Plants*, which bear his name, combats the opinions of EMPEDOCLES, and his followers, respecting the sentient and animated principle in vegetables; yet it is evident

dent he had himself no decisive ideas, or specific knowledge, drawn from nature, relating to the *sex* of plants. He placed it, in some instances, in the different habit alone, or in other discriminations foreign to the consideration of the flower; and, though he shews an inaccurate knowledge of the particular circumstances of the palm, and the fig-tree, yet he denies, in another place, that either of them produce flowers.

This imperfect idea of the *sex* of flowers, in the *Date*, and even in the *Fig-tree*, is of high antiquity; being recorded by HERODOTUS, THEOPHRASTUS, and PLINY. The necessity which the antient cultivators of the *Date-tree* were under, of promoting the action of the male-flowers on the female, which operation held also in some measure in the *Fig-tree*, the *Pistachia*, and the *Mastic*, would almost necessarily suggest the application of this analogy with the animal kingdom. Nevertheless, although the fact was thus obtruded on their senses, inattentive to the structure of flowers, and ignorant of the offices of the several parts, they remained unacquainted with the true operations

rations of nature in this phænomenon, though daily present to their observation.

The antient fathers of botany, and particularly DIOSCORIDES, it is true, applied the distinction of male and female to many other plants; but it was entirely without regard to true analogy, or discrimination of functions in the flower. It was frequently applied to such as carry all the parts of the flower within the same *calyx*, or on the same stalk; on account of stature; greater degree of fertility; or other marks unconnected with the fructification. In the *diæcious*, or such as have the *stamina*, and *pistils*, on separate plants of the same species, the real male plant was, in some cases, denominated the female; of which the *Mercurialis* may be mentioned as one instance, among several others.

Exclusive of a numerous set of plants, in which the *stamina* and *pistils* are separately placed, either on different parts of the same individual, or on different plants of the same species, constituting the *Monæcious* and *Diæcious* classes of LINNÆUS, the following

following *genera*, from other tribes, as recited below *, contain species to which DIOSCORIDES has applied the distinction of male and female, from circumstances having no analogy with those of the *Date-tree*.

This doctrine of the sexual analogy between plants and animals, made but little progress with the *literati* in botany, upon the revival of science; since the first of those who mention it, is CÆSALPINUS. This critical and learned author notices male and female plants in the *Oxycedrus*,

• Arundo	Mandragora
Anagallis	Pæonia
Aristolochia	Polygonum
Cistus	Tithymalus
Filix	Verbascum, &c. &c.

To which have been added, by others,

Abrotanum	Nicotiana
Abies	Orchis
Amaranthus	Pulegium
Balsamina	Quercus
Caltha	Symphytum
Cornus	Tilia
Crista Galli	Veronica,
Ferula	&c. &c.

Taxus,

Taxus, *Mercurialis*, *Urtica*, and *Cannabis*; of which he says, the barren plants are males, and the fertile females; adding, that the latter, as is observed in the *Date-tree*, becomes more fruitful by being planted near the males; from thence receiving a genial *effluvium*, which excites a stronger fertility. From this observation, it may almost be inferred, that he had instituted experiments on some of these kinds; but we do not find that he carried the idea beyond the above-mentioned species, to vegetables in general.

Adam ZALUZIANSKY, a *Polish* writer in 1592, is said, by some, to have distinguished the *sexes* of plants. I have not seen his book; but, from what is found relating to his opinion in other writers, I conjecture that his observations, if not wholly taken from *CÆSALPINUS*, do not exhibit any original matter on this subject. In fact, no further progress was made for near an hundred years after this time; and the honour of the discovery, “ that this sexual process was universal in the vegetable kingdom, and that the dust of the *antheræ* “ was

“ was endowed with an impregnating power,” is due to *England*.

Whether the true idea of this process originated with Sir *Thomas* MILLINGTON, to whom it has been ascribed, may justly admit of a doubt ; since Sir *Thomas* has left no written testimony on the subject ; and Dr. GREW’s mention of him does not imply that he actually received the idea from him. Add to this, that Mr. RAY, in the summary view of all GREW’s discoveries, which he has prefixed to his “ History of “ Plants,” does not once mention Sir *Thomas* MILLINGTON’s name. Interested as we must suppose Mr. RAY to have been, in every discovery relating to vegetables, and candid as he was in his general conduct to the learned, it is not likely that he should have failed, in this instance, to render praise where it was so justly due. When we further recollect, that Dr. GREW had been some years engaged in those microscopical experiments, on the anatomy of plants, which have rendered his name estimable with all posterity, that whilst he was thus employed in studying so intimately
the

the organization of vegetables, and had observed, that in whatsoever parts the flower might be deficient, the attire, (or *stamina*, and *apices*) is ever present, it is not strange that the true idea of its use should have been suggested to him.

Dr. GREW laid his opinion before the Royal Society, in a lecture on the anatomy of flowers, read Nov. 6, 1676; in which he maintained, “ That the primary and
 “ chief use (of the dust of the *apices*) is
 “ such as has respect to the plant itself,
 “ and so appears to be very great and necessary: because even those plants which
 “ have no flower, or foliature, are yet some way or other *attired*, so that it seems to
 “ perform its service to the seed as the foliature to the fruit. In discourse hereof
 “ with our learned *Savilian* professor, Sir
 “ Thomas MILLINGTON, he told me, that
 “ he conceived that the *attire* doth serve
 “ as the male for the generation of the
 “ seed. I immediately replied, that I was
 “ of the same opinion, gave him some reasons for it, and answered some objections
 “ that might oppose them.” He then ex-

plains himself farther, and advances, that this fecundating power was not effected by the actual admission of the *farina* into the seed-vessel, but by means " of subtle and " vivific effluvia."

Mr. RAY admitted the opinion of Dr. GREW, but, at first, with all that caution which becomes a philosopher ; as appears in his "*Historia Plantarum*," vol. i. p. 18. *Nos ut verisimilem tantum admittimus*. He assents to it with less reserve in his "*Synopsis Stirpium Britannicarum*," edit. 1. 1690, p. 28 ; and in the preface to his "*Sylloge Stirpium Europæarum*," published in 1694, we find him producing his reasons for the truth of it, and yielding his full approbation to it.

In 1695, Rudolph Jacob CAMERARIUS, professor of botany and physic at *Tubingen*, in his "*Epistola de Sexu Plantarum*," appears among the early advocates for this analogy ; and, being convinced by the arguments of GREW and RAY, seems to have been the first who gave stability to the whole by experiments. These he made on *Maize*, the *Mulberry*, the *Ricinus*, and the *Mercurialis*; the three first of which he deprived

deprived of the stamiferous flowers, and the last he separated far from the female, and found, in all, that the fruit did not ripen. CAMERARIUS, however, very fairly produces also, some objections against the doctrine, founded on experiments, which at this day have little weight, since they were made on plants of the *Cryptogamous*, or *Diœcious* classes; in the last of which, it is now known, that sometimes a flower or two of a different sex, may be found intermixed with others.

In 1703, Mr. Samuel MORLAND, desirous, as it should seem, of extending the *Lewenboekian* system of generation into the vegetable kingdom, produced a paper before the *Royal Society*, in which he advances—that the *farina* is a *congeries* of seminal plants, one of which must be conveyed through the style into every *ovum*, or seed, before it can become prolific. Mr. MORLAND's hypothesis tended to confirm the general doctrine by exciting curiosity on the subject, at a time when *Lewenboek's* theory was popular; but was not admissible in itself, since few styles are hollow, or, if

perceptibly tubular, not pervious enough to admit particles of the usual magnitude of the *farina*.

After this time, several of the learned on the continent entered into researches on this subject. M. GEOFFROY, in 1711, in a paper read before the *Royal Academy of Sciences*, after having formed a theory by conciliating GREW's and MORLAND's into one, concludes by asserting—that the germ is never to be seen in the seed, till the *farina* is shed; and that if the plant is deprived of the *stamina*, before this dust is fallen, the seed will either not ripen, or will not prove fertile.

It is matter of surprize, that the illustrious TOURNEFORT should wholly reject the doctrine of the *sexes* of plants. So far even from acknowledging this function of the *farina*, that he held it to be excrementitious. See *Isagoge in Rem Herbariam*, p. 70.

Julius PONTEDERA, a strenuous follower of TOURNEFORT, a noble *Italian* of *Pisa*, illustrious for his knowledge of the ancient languages, and antiquities of *Italy*, and not less celebrated for botanical knowledge

and literature, combats also the notion of this analogy, and uses of the *stamina*, through the whole second book of his "*Anthologia*." In the end he rejects the sexual analogy, and considers it as entirely chimerical. But finding all flowers furnished with a style, or tube, he advances, that it serves to convey the air to the fruit, by which, an intestine and fertilizing motion is excited in the seed, or ovary.

In 1718, Monf. VAILLANT published "*Sermo de Structura Florum, horum Differentia, usque Partium*;" which had been read the year before, at the opening of the Royal Garden. In this discourse, he describes the bursting of the *antheræ*, in a style too florid for philosophical narration. He relates several of his own discoveries on the nature of the *farina*, and the exploding power of the *antheræ*, and concludes with assenting entirely to Dr. GREW's sentiment, (though without naming him), that impregnation is performed by means of a subtle *aura*, and not by the transmission of the dust through the style, alledging against it those

reasons I have mentioned, in speaking of MORLAND's opinion.

In *England*, about the same time, Dr. *Patrick* BLAIR, by his "*Botanick Essays*," contributed greatly to extend the knowledge, and confirm the truth of this subject. BRADLEY, FAIRCHILD, MILLER, and others, assisted in the same design; and, since that period, I believe it has met with few opposers. One of the most formidable was the late learned Dr. *Alston*, professor of botany at *Edinburgh*, from whose laboured disquisition, the adversaries to this opinion of the *sex* of flowers, may furnish themselves with the most cogent arguments, that an intimate knowledge of the subject hath enabled a very diligent and learned writer to produce.

The more recent experiments made by the Abbe SPALANZANI, with a direct view to impugn this doctrine, do not appear to have been conducted with that degree of skill, and accuracy, which is sufficient to outweigh the numerous train that may be thrown into the opposite scale. Even

some of the Abbe's own experiments seem rather to strengthen the opinion he means to overthrow.

Having traced the history of this important process in the economy of vegetables, to the time of LINNÆUS, I judge it will be unnecessary, to accompany the reader through a particular detail of authors below this period. In 1732, LINNÆUS founded his system on this doctrine; and the additional arguments, and experiments, produced by himself, his pupils, and followers, have established the truth of it, to the complete satisfaction of impartial enquirers. Those, however, who wish to peruse the most perfect summary of all the arguments, and experiments, in favour of this analogy, are referred to the "*Sponsalia Plantarum*," written in the year 1746, and printed in the first volume of the "*Amœnitates Academicæ*," and to the "Dissertation on the Sexes of Plants," written by LINNÆUS in 1760, which obtained the premium of the Academy of *Peterburgh*, and has lately been translated into *English* by the ingenious and learned possessor of the *Linnæan* collec-

tion. To which may be added, the writings of KOELRUTER, in the succeeding year, which have not a little tended to confirm the subject in question,

It would be unjust to the memory of Dr. GREW, to conclude this history, without remarking, that the result of the latest, and best experiments, have confirmed his idea, “ that the *farina* itself is not carried to the “ *rudiment* of the seed,” but, that fecundation is effected by the effluvia. This will appear, by citing the summary view of the doctrine, as exhibited by LINNÆUS himself, in the Dissertation above mentioned,

“ While plants are in flower, the *pollen*
“ falls from the *antheræ*, and is dispersed
“ abroad. At the same time that the *pollen*
“ is scattered, the *stigma* is then in its
“ highest vigour, and for a portion of the
“ day at least is moistened with a fine dew.
“ The *pollen* easily finds access to the *stigma*
“ *ma*, where it not only adheres by means
“ of the dew of the part, but the moisture
“ occasions its bursting, by which means
“ its contents are discharged. What issued
“ from

“ from it being mixed with the *fluid* of
“ the *stigma*, is conveyed to the *rudiments*
“ of the *seed*.”

I remark before I conclude, that, how just soever it may have been in a philosophical view, to consider the *stamina* and *pistils*, as answering to the respective functions of *sex* in the animal kingdom, it should not have been forgotten, that in animals, this process is voluntary; but that in vegetables, notwithstanding all that the ingenuity of the ancients and moderns have urged in defence of the sentient principle, we are not yet justified in referring this process to any other than what we are accustomed to call a mechanical cause.

The principle of this it will not be expected that I should explain. It may be conjectured, that after a perfect elaboration of the juices in the *antheræ* and *stigmata*, some species of attraction takes place between them, perhaps of the electrical kind, somewhat like this having been manifested in the flashings observable in some flowers in the evenings. The reader will easily perceive, that I refer to the appearance first
seen

seen in the *Indian Cresses*, (*Tropæolum majus*) by *Elizabeth Christina*, the daughter of LINNÆUS, as related in the *Swedish Acts* in 1762, and since confirmed in the *Garden Marigold* (*Calendula officinalis*), the *Orange*, or *bulbiferous Lily* (*Lilium bulbiferum*), and the *African Marigold* (*Tagetes patula et erecta*), by the observations of M. HAGGREN. And, as in the universe at large, the phenomena of electricity are sensibly manifested to us by particular modifications of the principle occasionally excited, although unquestionably ever active, so, possibly, the same principle may prevail through the whole vegetable creation in the process above mentioned, though unobserved hitherto, except in these instances. Be this as it may, that general decorum, which is due to philosophical subjects, ought to have restrained that reprehensible language used by *Vaillant*, and some other writers on this subject, and even by LINNÆUS himself, which has justly disgusted many readers, and prejudiced the instruction they meant to convey.

C H A P. 26.

Willisell—*Collects plants for* Merret, Morison, Ray, and Sherard—*His Notices on the Mistletoe.*

Plott—*Anecdotes of—His Natural history of Oxfordshire and Staffordshire.*

Natural history of counties—Plott the first writer—Leigh's Lancashire—Robinson's Westmorland—Moreton's Northamptonshire—Borlace's Cornwall—Wallis's Northumberland.

Wheler—*Anecdotes of—Journey into Greece—Introduced some new plants into England.*

W I L L I S E L L.

IT is not to the sons of erudition alone, that botany is indebted for all its discoveries, and improvements. The love of plants has, not unfrequently, seized, with uncommon ardour, the minds of many, on whom the light of learning had not shed its influence; and spurred them on, in the pursuit of this knowledge, to attainments that have been highly beneficial to the science,

ence. From such, let not the pride of learning withhold that praise which is so justly due. One of the most remarkable instances of this kind, is well known to those who are conversant with the writings of MERRET, RAY, and MORISON; and I feel regret at not being able to commemorate the name of *Thomas WILLISEL*, with some of the circumstances of his life; since I am uninformed of the time, and place, both of his birth, and of his death. This industrious man seems to have devoted much of his life to the investigation of *English* plants; and, as he lived at a time when *British* botany was yet imperfect, he added largely to the stock of new discoveries. He was employed by Dr. MORISON, soon after his establishment at *Oxford*, to collect rare *English* plants; and Dr. MERRET informs us, as hath been noticed, that he travelled five summers at his expence, into the different parts of *England*, to make collections for his "*Pinax*;" which appears to have been greatly enriched with many of the most rare species, by the labours of WILLISEL.

I believe

I believe he was once sent into *Ireland* by Dr. SHERARD. Mr. RAY was benefited by his researches; and, if I do not mistake, he accompanied that celebrated naturalist in one of his tours. The emolument arising from these employments was probably among the principal means of his subsistence.

His knowledge was not confined to the vegetable kingdom; since Mr. RAY informs us, that “ he was employed by the “ *Royal Society* in the search of natural rarities, both animals, plants, and minerals; for which purposes he was the fittest man in *England*, both for his skill “ and industry.”

In the letters of Mr. RAY, there occurs an observation made by WILLISEL, of the various trees on which he had found the *Mistletoe* growing. I enumerate them below*.

* Oak.	Purging Thorn.
Ash.	Quicken Tree.
Lime.	Apple Tree.
Hazel.	Crab Tree.
Willow.	White Thorn.
White Beam.	

P L O T T.

Dr. *Robert* PLOTT, eminent for being the first who sketched out a plan for a natural history of *England*, by exemplifying it in that of *Oxfordshire* and *Staffordshire*, although not professedly a writer in the botanic line, cannot be omitted in a work of this kind.

He was born at *Borden*, near *Sittingborne*, in *Kent*, and educated at *Wye*, in the same county; entered a student in *Magdalen Hall*, in 1657; and, in 1671, took the degree of doctor of laws. He became fellow of the *Royal Society*, and was made one of the secretaries in 1682. In the same year he was constituted the first keeper of the *Ashmolean Museum*, and professor of chymistry: all which places he kept till 1690; having also, in 1687, been appointed *Mowbray* herald extraordinary, and register to the earl marshal, or court of honour, then newly revived, after having lain dormant from the year 1641. He died April 30, 1696. There is a whole length portrait of him,

him, the last of the right hand group, in the *Oxford Almanack* for the year 1749.

Dr. PLOTT was a man of various erudition, but is at this time best known for his natural histories of *Oxfordshire*, and of *Staffordshire*. The first of these was published in 1677, in folio; and again in 1705, with the author's corrections and additions, by his son-in-law, Mr. *Burman*, vicar of *Newington*, in *Kent*. The natural history of *Staffordshire*, in 1679, in folio, and reprinted in 1686. In each of these volumes, he records the rare plants of the county, describes the dubious ones, and such as he took for nondescripts, and figures several of them. To these works the *English* botanist owes the first knowledge of some *English* plants; and this circumstance justly entitles him to a place in this work *. He conducted the publication of the *Philosophical Transactions* during part of his secretaryship to the Society, and wrote the following papers :

* It is amusing to remark the price of literature a century ago. The subscription for PLOTT's *Staffordshire* was, a penny a sheet, a penny a plate, and six pence the map.

A Paper

A Paper on the Formation of Salt and Sand from Brine of the Pits in *Staffordshire*. Printed in N° 145.

On Perpetual Lamps, in imitation of the sepulchral lamps of the antients, N° 166.

On the Incombustible Cloth made of the *Asbestos*. Ib.

A History and Register of the Weather at *Oxford* during the year 1684. N° 169.

On the Black Lead of *Cumberland*. N° 240.

On the best Time for felling Timber, which, with the antients, he advises to be performed in the Autumn.

On an *Irish* Giant, nineteen years of age, and measuring seven feet six inches in height. N° 240.

A Catalogue of Electrical Bodies. N° 245.

NATURAL HISTORY OF COUNTIES.

I have before observed, that Dr. PLOTT was the first author of a separate volume on Provincial Natural History; in which, it is but justice to add, that, with due allowance for the time when he wrote, he has not been

been excelled by any subsequent writer. It were to be wished, that more examples of the like kind might be adduced ; but there are few exactly of the same scope. After Bishop GIBSON, in his edition of CAMDEN, printed in 1695, had inserted the provincial lists of plants drawn up by Mr. RAY, several writers of county histories have, either from their own knowledge of the subject, or by the aid of friends, inserted catalogues of the *more rare* plants in their respective works. As these form, in an especial manner, a part of *English* botany, it is incumbent upon me to enumerate them.

The first after CAMDEN, is "The Natural History of *Lancashire, Cheshire, and the Peak in Derbyshire.*" Oxford, 1700. fol. By *Charles LEIGH*, M. D. The author takes into his catalogue the maritime plants, with the others, and briefly recites the virtues, and the medicinal classes, to which the subjects belong. He subjoins his conjectures on the food of vegetables, and contests the opinion of Dr. WOOD-

WARD, that plants are nourished by the earthy principle alone.

“An Essay towards a Natural History
“of *Westmorland* and *Cumberland*, wherein
“an account is given of their several mi-
“neral and surface productions.” By *Thomas* ROBINSON, rector of *Ousby*, in *Cum-
berland*. 1709. 8°. The scope of this vo-
lume principally takes in the fossils of these
northern counties. The author has been
mentioned before, as a correspondent of
Mr. RAY. He here enumerates profes-
sedly the plants not mentioned in the *Syn-
opsis* of that author, amounting to about
twenty; of which, however, some were
only varieties.

“The Natural History of *Northampton-
shire*, with some account of the Antiqui-
“ties.” By *John* MORETON, A.M. F.R.S.
rector of *Oxendon*, in the same county.
Lond. 1712. fol. This is a work of me-
rit. In the list of plants, several occur ad-
ditional to those noticed by RAY; even
some of the mosses are not forgotten. The
author treats largely on figured fossils, of
which

which his book contains many elegant plates.

Of "the Natural History and Antiquities of *Surrey*, begun in the year 1673, by *John AUBREY*, Esq. F. R. S.; published by Dr. RAWLINSON, in 5 vol. 8°. Lond. 1719;" I can only recite the title.

In the "*Natural History of Cornwall*," by *William BORLACE*, A. M. F. R. S. Oxford, 1758, we meet with a very brief list, containing about thirty-eight land plants, and twenty *fuci*, with some scattered remarks on the qualities and uses. Among the rare plants are the Verticillate Knotgrass, the Roman Nettle, the Gunhilly Heath, and the Cornish Pennywort; of which last there is a very indifferent figure in tab. 29. f. 6. Under the article Sun-dew, (*Drosera*) there is a curious and interesting observation made by Dr. BORLACE, in which he asserts, that the well-known pernicious quality of that vegetable, in producing the rot among sheep, where it abounds, does not arise from any caustic power in the vegetable, but from an insect, which lays its eggs, and feeds on the

A a a plant.

plant. From his account, this insect appears to be the *Dropfy Worm* of Dr. TYSON, or the *Hydra Hydatula* of LINNÆUS.

“The Natural History and Antiquities
“ of *Northumberland*, and of the North Bi-
“ shopric of *Durham*, lying between the
“ *Tyne* and *Tweed*.” By *John WALLIS*,
M. A. 2 vol. 4°. Lond. 1769. The
eighth chapter of the first volume treats
on the vegetable productions of this tract,
with the various medicinal and œconomi-
cal uses.

In the “History and Antiquities of the
“ Counties of *Westmorland* and *Cumber-*
“ *land*,” by *Joseph NICHOLSON*, Esq. and
Richard BURN, LL. D. 2 vol. 4°. 1777,
the reader will meet with some observations
on the natural history interspersed; but
the botanist will find but little interesting
in his way.

From CAMDEN, from these histories,
and other resources, Professor MARTYN
has compiled an abridged list of all the rare
plants, digested in the order of the coun-
ties, which is intended for the use of the
travelling

travelling botanist See the "*Plantæ Cantabrigienses.*" Lond. 1763; from p. 44—144.

W H E L E R.

As I do not strictly confine myself to such writers, as have distinguished themselves by their discoveries in the indigenous botany of *Britain*, alone, I cannot therefore omit to mention so eminent a man as Sir *George WHELER*. He was the son of Col. *WHELER*, of *Charing*, in *Kent*; and was born in 1650, at *Breda*, his parents being there in exile with the royal family. At the age of seventeen, he became a commoner of *Lincoln College, Oxford*; and, before he took any degree, went on his travels. He spent near two years in *France* and *Italy*; and, in 1675, travelled into *Greece* and *Asia Minor*; from whence he returned in *November* 1676. He was knighted before he took his master of arts degree, which was conferred upon him in 1683, in consideration of his learning, and in return for a present of antiquities collected in his travels. He afterwards took
some

some valuable preferments in the church; was created doctor of divinity in 1702; and died Feb. 18, 1724.

In 1682, was published, "A Journey into *Greece*, by George WHEELER, Esq. in company of Dr. SPON, of *Lyons*; in six books; with four tables of coins, and many other sculptures." Fol. pp. 483.

These gentlemen travelled with PAUSANIAS in their hands, by whose means they corrected, and explained, several of the antiquities and traditions of *Greece*. The primary objects of these learned travellers were, to copy the inscriptions, and describe the antiquities and coins of *Greece* and *Asia Minor*, and particularly of *Athens*, where they sojourned a month. These travels are highly valued for their authenticity, and are replete with sound and instructive erudition to the medallist and antiquary.

Mr. WHEELER appears, on all occasions, to have been attentive to the natural history of *Greece*, and particularly to the plants, of which he enumerates several hundreds in this volume, and gives the engravings of some. These catalogues sufficiently evince his

his knowledge of the botany of his time. He brought from the East several which had not been cultivated in *Britain* before. Among these, the *Hypericum olympicum* (St. John's Wort of Olympus) is a well-known plant, introduced by this learned traveller. RAY, MORISON, and PLUKENET, all acknowledge their obligations for curious plants received from him.

After Sir *George WHELER* entered into the church, he published "An Account of the Churches and Places of Assembly of the Primitive Christians; from the Churches of *Tyre, Jerusalem, and Constantinople*, described by *Eusebius*, and ocular Observations of several very ancient Edifices yet extant in those Parts: with a seasonable Application." Lond. 1689.

The Rev. *Granville WHELER*, of *Otterden Place, Kent*, and rector of *Leak, in Nottinghamshire*, who died in 1770, was the third son of Sir *George WHELER*, and became his heir. He distinguished himself as a gentleman of science, and a polite scholar. He was the friend and patron of Mr. *Stephen*

GRAY; who, jointly with him, contributed to revive the study of electricity in *England*. Let me be allowed to add, that I wish to mention the name of this gentleman with gratitude, from the recollection of that encouragement which I personally received from him in my pursuits of natural history, at a very early period of life; and which was of such a nature, as seldom fails to animate the minds of the young, to exertion and improvement.

—END OF THE FIRST VOLUME.

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I can Turner died 1585
- D. Bullock etc. in Philadelphia 1580-1581.
munkon from Hamilton of Oxford 78. 81

Rev. J. Newton (died 1607.) p. 108

Rev. J. Altham of Hatfield, near St.
Albans mentioned by Hanson in his
enlarged ed. of Gerard's Herbal 1633
p. 1636 p. 137

Rev. W. Browne (died 1678) p. 167 main
author of Catalogus Horti Botanici Oxon.
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